

National Park Service  
U.S. Department of the Interior  
Glacier National Park  
Waterton-Glacier International Peace Park  
Montana



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# Swiftcurrent Bridge Replacement Environmental Assessment / Statement of Findings (Floodplains)

February, 2014



Swiftcurrent Bridge, c. 1930. Photo courtesy of Glacier National Park Archives

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# Environmental Assessment/Statement of Findings Swiftcurrent Bridge Replacement

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## Summary

The Swiftcurrent Bridge, which provides visitors to the Many Glacier Valley access to the Many Glacier developed area and Many Glacier Hotel, is rapidly losing its structural integrity. The bridge deck is severely damaged and the abutment and piers are in disrepair. Ice break up in Swiftcurrent Lake is causing additional wear and stress to the piers and abutments. Utilities for sewer, water, phone and electricity are partially encased in conduit alongside the deck and beneath the sidewalk, failing to meet code for separation and detracting from the aesthetic appearance of the bridge. The bridge has been determined eligible for listing in the National Register of Historic Places but cannot be repaired without losing its historic integrity. Therefore, Glacier National Park is proposing to replace the Swiftcurrent Bridge with a clear span bridge.

This environmental assessment (EA) evaluates two alternatives, including a no action alternative. Under the no action alternative, the Swiftcurrent Bridge would not be replaced and the structure would continue to deteriorate until access across the lake outlet could no longer be safely maintained. Under the action alternative, the existing Swiftcurrent Bridge would be replaced with a new, approximately 85-foot long, clear span bridge (no pilings or piers in the lake/stream channel). The proposed bridge replacement would be funded by the Federal Lands Transportation Program.

This EA 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 the objectives of the proposal, 2) evaluates potential issues and impacts to Glacier National Park's resources, and 3) identifies mitigation measures to lessen the degree or extent of these impacts. Resource topics analyzed include historic structures and cultural landscapes, visitor use and experience, floodplains, water resources, wildlife, grizzly bears, Canada lynx, wolverine, and natural soundscapes. All other resource topics were dismissed because the project would result in negligible to minor effects to those resources, or because the resource is not found in the analysis area, the issue is not applicable to the proposal, or the resource would not be affected by the project. Public scoping was conducted in accordance with the National Environmental Policy Act (NEPA), and the comments received were in support of the proposed project.

**How to Comment**— If you wish to comment on the EA, you may post comments online at <http://parkplanning.nps.gov/SwiftcurrentBridge> or mail or hand deliver comments to Superintendent, Glacier National Park, Attention: *Swiftcurrent Bridge EA*, PO Box 128, West Glacier, Montana 59936. This environmental assessment will be on public review for 30 days. Before including your address, phone number, email 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

***The purpose of Glacier National Park is to:***

- preserve and protect natural and cultural resources unimpaired for future generations (1916 Organic Act);
- provide opportunities to experience, understand, appreciate, and enjoy Glacier National Park consistent with the preservation of resources in a state of nature (1910 legislation establishing Glacier National Park); and
- celebrate the on-going peace, friendship, and goodwill among nations, recognizing the need for cooperation in a world of shared resources (1932 International Peace Park legislation).

***The significance of Glacier National Park is explained relative to its natural and cultural heritage:***

- Glacier's scenery dramatically illustrates an exceptionally long geological history and the many geological processes associated with mountain building and glaciation;
- Glacier offers relatively accessible, spectacular scenery and an increasingly rare primitive wilderness experience;
- Glacier is at the core of the "Crown of the Continent" ecosystem, one of the most ecologically intact areas remaining in the temperate regions of the world;
- Glacier's cultural resources chronicle the history of human activities (prehistoric people, Native Americans, early explorers, railroad development, and modern use and visitation) and show that people have long placed high value on the area's natural features; and
- Waterton-Glacier is the world's first international peace park.

### Introduction

Glacier National Park is an approximately one million acre park in the Northern Rockies of northwestern Montana, along the United States-Canadian border. The park straddles the rugged mountains of the Continental Divide, and is at the center of the Crown of the Continent Ecosystem. The Crown of the Continent ecosystem encompasses approximately 28,000 square miles (72,000 square kilometers) of mountainous terrain between the southern regions of British Columbia and Alberta in Canada and the Blackfoot River south of Montana's Scapegoat Wilderness. Together with Canada's Waterton Lakes National Park, Glacier National Park forms the Waterton-Glacier International Peace Park, the world's first international peace park. The parks are listed together as a World Heritage Site and separately as International Biosphere Reserves. Outstanding natural and cultural resources are found in both parks. Glacier National Park's primary mission is the preservation of natural and cultural resources, ensuring that current and future generations have the opportunity to experience, enjoy, and understand the legacy of Waterton-Glacier International Peace Park.

The Many Glacier developed area in the park's Many Glacier Valley includes the National Historic Landmark Many Glacier Hotel within the larger Many Glacier Hotel Historic District, listed in the National Register of Historic Places. The Swiftcurrent Bridge provides the only access to the site for thousands of visitors every year, including vehicle and pedestrian traffic as well as concessioner operated horseback rides. The Swiftcurrent Bridge is rapidly deteriorating. Inspection reports prepared by the Federal Highway Administration (FHWA) and its contractors list its structural condition as poor to fair due primarily to concrete deck deterioration. The bridge also has limited capacity to handle high water during ice break up on Swiftcurrent Lake in the spring. The inspection reports recommend that the bridge be replaced. The National Park Service (NPS) is therefore proposing to replace the Swiftcurrent Bridge with a new, clear span bridge. If the bridge is not replaced, it is likely that the existing structure will eventually be unsafe for vehicle and possibly equestrian and pedestrian traffic as well, and ultimately access across the bridge would be limited or prohibited.

The historic significance of the Swiftcurrent Bridge was not evaluated when the Many Glacier Hotel Historic District

National Register Nomination was last revised in 1995. Since then, the bridge has been determined to be eligible for listing in the National Register of Historic Places (Boughton 2010). The new bridge would be designed to be compatible with the historic and architectural characteristics of the historic district.

This environmental assessment 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

The Swiftcurrent Bridge was built in 1929-30 as part of a project to reconstruct the Babb-Many Glacier Road, which provides access from Babb, Montana to Glacier National Park's scenic Many Glacier Valley. Spanning Swiftcurrent Creek at the outlet of Swiftcurrent Lake, the bridge provides the only vehicular and pedestrian access to the Many Glacier developed area and the historic Many Glacier Hotel, which are among the most popular destinations in the park.

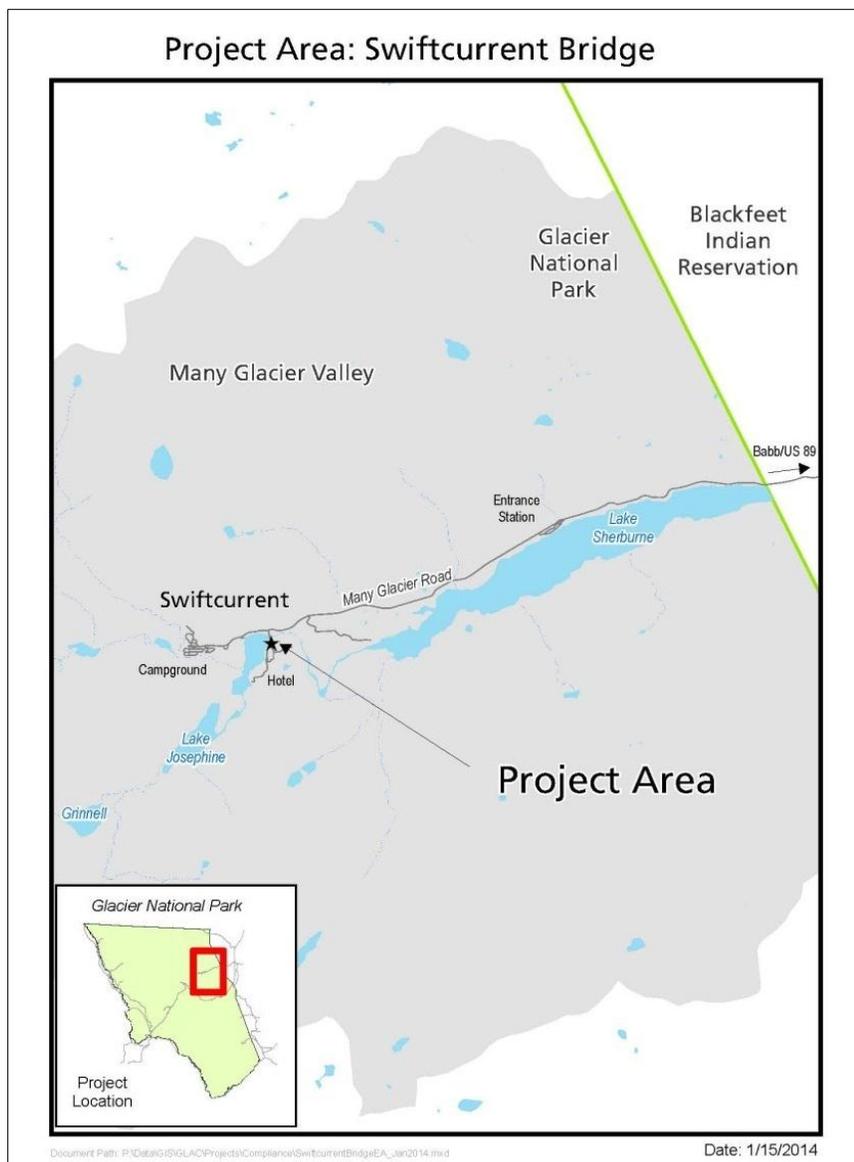


Figure 1: Project Area

In 1929, the NPS Division of Landscape Architecture developed the plans for the Swiftcurrent Bridge, and Chief Landscape Architect Thomas Vint approved the design. The location of the bridge and its impact on the landscape were apparently considered so sensitive that the project underwent an unusual final review by noted landscape architect Ferruccio Vitale, a member of the U.S. Commission of Fine Arts, which typically only reviewed plans for monuments and memorials. The completed structure reflected the NPS design philosophy of the period and blended well within its surroundings. The thin deck and metal railing lessened the potential appearance of a dam at the lake outlet. The 75-foot long, five-span concrete deck bridge includes four stone piers and two stone abutments. In 1942, due to erosion from ice, the bridge's piers were reinforced with steel pins, a concrete veneer, and protective steel shields. In 1958, the deck was paved and new concrete was laid over the walkway to serve as a utility chase.

At this time, the Swiftcurrent Bridge is rapidly losing its structural integrity. The deck is severely damaged, and the abutments and piers are in disrepair. The bridge also has limited capacity to handle high water due to the four interior piers. Hydrologic issues worsen during spring break up when fragments of ice flowing off Swiftcurrent Lake are trapped by the piers. Ice break up is also resulting in scour, wear, and stress to the piers and abutments. Other concerns are the severely deteriorated concrete curb and sidewalks, loose or missing stone masonry, and the suspended utility conduits and multiple lines of flexible cable/wiring alongside the bridge's deck and encased within the sidewalk.



**Figure 2:** Swiftcurrent Bridge. NPS photo.

Bi-annual bridge inspection reports from the FHWA conducted since 2007 have noted continued deterioration of the bridge and recommended its replacement within five years (FHWA 2012). The FHWA contracted two additional reports in 2011 and 2012 to evaluate the potential for rehabilitation of the bridge (Collins Engineers, Inc. 2011 and Parsons Brinckerhoff 2012). These reports found severe deterioration of the concrete deck and deterioration in the abutments and piers. An underwater visual inspection of the abutments and piers found them to visually be in good condition, but could not determine their bearing capacity or interior condition because the masonry is encased in concrete. On the basis of these reports, the FHWA and the NPS determined that rehabilitation of the bridge was not a feasible alternative. Replacing the historic Swiftcurrent Bridge would be an adverse effect under Section 106 of the National Historic Preservation Act.

## **Purpose and Need**

The purpose of the proposed action is to preserve access (including vehicle and pedestrian traffic as well as concessioner-operated horseback rides) to the Many Glacier developed area while maintaining the historic character of the Many Glacier

Hotel Historic District. The Swiftcurrent Bridge has been found to be deficient and needs to be replaced in order to preserve access. The objectives of the project would be to:

- Maintain access across the Swiftcurrent Lake outlet to the Many Glacier developed area and Many Glacier Hotel.
- Maintain the historic character of the Many Glacier Hotel Historic District and minimize adverse impacts to historic properties to the extent possible.
- Address safety concerns associated with the severely deteriorated bridge, including non-code compliant utility lines.
- Minimize adverse effects to natural resources and protect natural stream and floodplain processes.

## **Relationship to Other Plans and Policies**

Current plans and policies that pertain to this proposal include the NPS Organic Act of 1916, the 2006 NPS *Management Policies*, Section 106 of the National Historic Preservation Act, Glacier National Park's *General Management Plan (GMP)* (NPS 1999), the park's *Final Commercial Service Plan* (NPS 2004), and Executive Order 11988 Floodplain Management. Following is more information on how this proposal meets the goals and objectives of these plans and policies:

- The proposal is consistent with the NPS Organic Act of 1916, which established the National Park Service and the agency's purpose to "conserve the scenery and the natural and historic objects and the wild life therein" and to "leave them unimpaired" for future generations."
- The proposal is consistent with the goals and objectives of the 2006 *NPS Management Policies* which state that "Enjoyment of park resources and values by the people of the United States is part of the fundamental purpose of all parks" (Section 8.2). The proposed bridge replacement would maintain visitor access to one of the most popular places in the park, one that provides a number of recreational opportunities, access to concessioner services, and opportunities to experience a biologically diverse natural area as well as an important historic district listed in the National Register of Historic Places.
- Section 5 of the 2006 *NPS Management Policies* speaks to the NPS's obligation toward stewardship of cultural resources, whereby the NPS will "protect, preserve, and foster appreciation of the cultural resources in its custody". The proposed bridge replacement is a stewardship activity that would continue to foster appreciation of an important historic area by maintaining visitor access. The new bridge would also be compatible with the historic architectural characteristics of the historic district to which it is a contributing feature.
- The NPS 2006 *Management Policies* and Director's Order-28 *Cultural Resource Management (DO-28)* require that management decisions and activities throughout the National Park System reflect awareness of the irreplaceable nature of cultural resources. Section 106 of the National Historic Preservation Act establishes a process to ensure that federal agency decisions are made with a full awareness of the historic properties affected, and ways to avoid or mitigate adverse effects are fully considered. DO-28 acknowledges that a project may be in the public interest even if it

results in the loss of a historic property. The NPS has notified the public and other interested parties of the proposed project and consulted early and frequently with the Montana State Historic Preservation Office (SHPO). A Memorandum of Agreement (MOA) to mitigate the adverse effect of the Swiftcurrent Bridge's demolition will be executed with the SHPO. The MOA will be submitted to the Advisory Council on Historic Preservation prior to approving the project. (See Appendix A for draft MOA).

- The project is in keeping with Glacier National Park's 1999 *General Management Plan*, which calls for the rehabilitation of the Many Glacier Hotel and maintaining visitor access and use of the Many Glacier Hotel Historic District.
- The project would uphold the objectives of the park's 2004 *Final Commercial Services Plan*, since visitor access to concession services in the Many Glacier developed area would be maintained.
- Executive Order 11988 Floodplain Management requires all federal agencies to "avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative". The proposed bridge replacement is consistent with Executive Order 11988 in that there is no practical alternative to the bridge location, and the new bridge would reduce the impacts of existing floodplain development and mitigate existing flood hazards to those developments.

## Scoping

Scoping is a process to identify the resources that may be affected by a project proposal, and to explore possible alternative ways to achieve the proposal while minimizing adverse impacts. Glacier 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 brochure to inform the public of the proposal to replace the Swiftcurrent Bridge and to generate input on alternatives and resource concerns. Scoping began on November 7, 2012, and the comment period closed on January 3, 2013. A press release was distributed to several media outlets and the scoping brochure was mailed to individuals and organizations on the park's planning mailing list, including members of Congress and various federal, state, and local agencies. An email announcement was sent to a number of interested parties with a link to the brochure on the NPS Planning, Environment, and Public Comment (PEPC) website, where scoping information was also posted. Glacier National Park notified the U.S. Fish and Wildlife Service (USFWS) of the proposed project and initiated informal consultation in accordance with Section 7 of the Endangered Species Act, and with the Montana State Historic Preservation Office (SHPO), the Confederated Salish and Kootenai Tribes, and the Blackfeet Tribal Business Council as required by 36 CFR800.

During the scoping period, four letters were received: from a park concessioner, the National Parks Conservation Association, the US Army Corps of Engineers (COE), and Montana Department of Environmental Quality (DEQ). The COE and Montana DEQ letters outlined permitting and other regulatory requirements for the proposed project. The other two letters were supportive of the proposal. Suggestions from the latter two letters included scheduling

construction to minimize impacts to park visitors, matching the design of the new bridge to the existing, minimizing impacts to water quality, and ensuring the bridge is safe for horse crossings. More information regarding external scoping can be found in the Consultation and Coordination section.

## **Identification of Impact Topics**

The NPS takes a “hard look” at all potential impacts by considering the direct, indirect, and cumulative effects of the proposed action on the environment, along with connected and cumulative actions. In the environmental consequences section of this EA, 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 or long-term. 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 environmental impact statement (EIS). Where the intensity of an impact could be described quantitatively, 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 the 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 the NPS dismisses an impact topic from further detailed evaluation in the EA. The reason the 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).

## **Impact Topics Retained for Further Analysis**

Impact topics for this project have been identified on the basis of federal laws, regulations, and orders; 2006 *Management Policies*; input from the Montana State Historic Preservation Officer; and NPS knowledge of resources at Glacier National Park and within the Many Glacier Valley. Impact topics that are carried forward for further analysis in this EA include:

- Historic structures and cultural landscapes
- Visitor Use and Experience
- Floodplains
- Water resources
- Wildlife
- Grizzly bears (threatened species under ESA)
- Canada lynx (threatened species under ESA)
- Wolverine (proposed for listing under ESA)
- Natural soundscapes

## **Impact Topics Dismissed from Further Analysis**

This section provides a limited evaluation and explanation as to why the following impact topics are not evaluated in more detail. Impact topics are dismissed from further evaluation 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.

**Federally Listed Threatened and Endangered Species and Candidate Species that have been dismissed from further analysis:**

Impacts to federally listed species are analyzed in accordance with NEPA and the Endangered Species Act (ESA). Section 7 of the Endangered Species Act requires all federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS) to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of listed species or critical habitats. In addition, the 2006 *Management Policies* and Director’s Order-77 *Natural Resources Management Guidelines* require the NPS to examine the impacts of projects on federal candidate species as well as state listed threatened, endangered, candidate, rare, declining, and sensitive species (NPS 2006).

The following species (Table 1) would not be affected by the project and are therefore dismissed from further analysis.

**Table 1:** Federally listed species that have been dismissed from further analysis.

Species	Status
Bull trout ( <i>Salvelinus confluentus</i> )	Threatened
Spalding’s catchfly ( <i>Silence spaldingii</i> )	Threatened
Water howellia ( <i>Howellia aquatilis</i> )	Threatened

**Bull Trout (*Salvelinus confluentus*).** Bull trout are listed as threatened under the Endangered Species Act and are also a state listed Species of Special Concern. Some portions of the Swiftcurrent drainage in the Many Glacier Valley have recently been designated as Proposed Critical Habitat (USFWS 2010). These areas do not include the project site, which is located upstream of Lake Sherburne in historically fishless habitat. As a result, the proposed project would not impact bull trout or bull trout habitat. While the proposed project would include in-stream work and may result in short-term, localized turbidity in Swiftcurrent Lake and Swiftcurrent Creek within the immediate vicinity of the bridge, the anticipated effects of these actions would not impact reaches of active bull trout habitat. Canyon Creek, located across Sherburne Reservoir from the Many Glacier Road is the only stream known to support bull trout in the area (J. Mogen, USFWS, personal communication). This project would have no effect on Canyon Creek, which is only accessible by trail. Some bull trout likely reside in Sherburne Reservoir, but the project would not impact reservoir habitat. Therefore, the proposed project would have no effect on bull trout and bull trout are dismissed from further analysis.

**Water howellia** (*Howellia aquatilis*) and **Spalding's catchfly** (*Silene spaldingii*). While present in Flathead County, there are no known locations of the threatened Spalding's catchfly or the threatened water howellia within Glacier National Park. Habitat for water howellia, a wetland-dependent species, may be present in the park, but habitat for Spalding's catchfly has not been identified. There are no recorded observations of water howellia or Spalding's catchfly in the vicinity of Swiftcurrent Bridge, nor is suitable habitat that could potentially support the species known to be present. If locations of listed plant species become known within the vicinity of the project area, the plants would be avoided. Consequently, there would be no impacts to Spalding's catchfly or water howellia from the proposed project and these species are dismissed from further analysis.

**Meltwater Stonefly** (*Lednia tumana*). Candidate Species. Due to the project site's low elevation, water temperatures are too warm to support the meltwater stonefly (J. Giersch, personal communication). The species is therefore not likely present, and is dismissed from further analysis.

**Whitebark pine** (*Pinus albicaulis*). Candidate Species. No trees would be removed for the proposed project, the work would be limited to the Swiftcurrent Bridge site, and whitebark pine would not be affected. Whitebark pine is therefore dismissed from further analysis.

**State-listed Species of Concern that have been dismissed from further analysis:**

A number of state-listed bird species of concern and potential species of concern have been documented within Many Glacier Valley. A bald eagle (*Haliaeetus leucocephalus*) nesting territory exists south of Lake Sherburne. No impacts to bald eagles are anticipated from either alternative due to the ample distance between the project area and the nesting eagles' primary use area, and because the majority of the work would occur outside the bald eagle nesting period. Golden eagles (*Aquila chrysaetos*) use the Many Glacier Valley for nesting and foraging and have used a nest site within the Many Glacier Road corridor in the past (last recorded occupation in 2007). The work would be isolated to the immediate vicinity of the bridge, golden eagle foraging habitat would not be impacted or limited during construction, and the majority of the work would occur outside of the golden eagle nesting period; therefore, the project is unlikely to impact golden eagles. Harlequin ducks (*Histrionicus histrionicus*) have been observed in several locations in Many Glacier, but the area's streams have not been documented as high-use harlequin breeding or brood rearing areas. Common loons (*Gavia immer*) have been observed on Swiftcurrent Lake and on Lake Josephine (GNP files). Nesting was documented on Swiftcurrent Lake in 2009, 20011, and 2012; nesting was not observed in 2013. Swiftcurrent Lake is not "critical" loon habitat as identified by the state, and the lake is not a known migratory staging area (MFWP 2009). The proposed project would not impact common loons because the work would not begin until well after the nesting season, when loons have typically migrated from their nesting areas. Additional species of concern in the Many Glacier Valley include the peregrine falcon, northern goshawk, pileated woodpecker, trumpeter swan, white-tailed ptarmigan, brown creeper, Clark's nutcracker, Barrow's goldeneye, and varied thrush (GNP files). A data report from the Montana Natural Heritage Program

(MNHP) contains records of the Pacific wren (*Troglodytes pacificus*) and Brewer's sparrow (*Spizella breweri*) within a one mile radius of the project area (MNHP 2013). The proposed project would be short-term and limited to the bridge site, and most of the work would occur well after the nesting season. Migratory species such as the Brewer's sparrow will have departed by the time work on the bridge is underway in the fall. If spring work occurs, it would not measurably affect state listed bird species of concern due to the lack of nesting habitat in the project area. Impacts on state-listed bird species of concern or their habitat would be negligible or less, and bird species of concern are therefore dismissed from further analysis.

The presence of grizzly bears, Canada lynx, and wolverines (which are state listed species of concern in addition to being federally listed or proposed for listing) in the Many Glacier Valley is well documented in park records (GNP files). These species are also included in the MNHP species of concern report (MNHP 2013). Impacts to grizzly bears, Canada lynx, and wolverine are addressed in this EA under *Affected Environment and Environmental Consequences, Threatened and Endangered Species*. Park and state records contain unconfirmed observations of fisher (*Martes pennanti*) in Many Glacier (GNP files, MNHP 2013). Though little is known about the distribution and movements of fishers, there have been no records of the species in the Many Glacier Valley after ten years of monitoring. No other mammalian species of concern would be measurably impacted by the proposed bridge replacement, and are therefore dismissed from further analysis.

There are no known records of the northern leopard frog in Glacier National Park. Despite its status as a state listed species of concern, the boreal toad is the most widespread amphibian in the park (Galloway 2013, C. Downs, NPS, personal communication). Transient use of the project area vicinity by amphibians is likely, especially along the lake shore, away from the bridge and lake outlet. Impacts on amphibians or their habitat would be no more than negligible to minor. Amphibian species of concern are therefore dismissed from further analysis.

While distribution and abundance of invertebrate species of concern within the park are not well known, the nature of the proposed activity is such that it would not affect invertebrate species in any measurable way. The MNHP species of concern data report includes three occurrences of the western glacier stonefly (*Zapada glacier*) in upper elevation reaches of the Swiftcurrent and Cataract drainages, and one record of the meltwater lednian stonefly at Snow Moon Lake (MNHP 2013). The meltwater lednian stonefly has already been discussed (see above). The western glacier stonefly is not likely to be present in the project area due to the site's low elevation and warmer water temperatures (J. Giersch, personal communication). The MNHP report also includes two records of a terrestrial snail species of concern, the shiny tightcoil (*Pristiloma wascoense*) near Grinnell Lake and Swiftcurrent Creek next to the developed area (MNHP 2013). The bridge site is mostly unvegetated and does not have suitable snail habitat; the shiny tightcoil would therefore not be affected by the project. Impacts to invertebrate species in the area would be negligible or less, and invertebrate species of concern are dismissed from further analysis.

**Vascular Plants and Moss.** Dense-leaf draba (*Draba densifolia*), alpine glacier poppy (*Papaver pygmaeum*), and pale corydalis (*Corydalis sempervirens*) occur in the Many Glacier Valley, within one mile of the project area (GNP files, MNHP 2013). All are alpine or wetland species and none occur at or within the immediate vicinity of the Swiftcurrent Bridge. Moonworts (genus *Botrychium*) are present within one mile of the bridge, but no specimens have been observed near or within the project area (GNP files, MNHP 2013). Impacts to vascular plant species of concern are therefore dismissed from further analysis.

### **Fisheries**

The entire basin upstream of the proposed project site is believed to have been historically fishless due to the waterfall located immediately downstream of the project site. This is the typical “hanging-valley” situation that developed in many of the drainages on the east side of the park as the glaciers receded and fish could not access upstream areas due to the development of waterfalls. Historically, Swiftcurrent Lake has been stocked with brook trout, cutthroat trout, arctic grayling, and rainbow trout. It currently supports introduced populations of brook trout and kokanee, although NPS records of stocking kokanee do not exist.

Sherburne Reservoir is located immediately downstream of the project area. The reservoir was formed by the construction of Sherburne Dam, located just outside of the park. The reservoir is a Bureau of Reclamation irrigation storage project. Water is stored in the winter and spring and released to irrigate farmland in eastern Montana in the summer. Construction of the reservoir inundated several miles of existing shallow lake/stream habitat. The reservoir is operated solely for water storage and release and as a result it has severe annual fluctuations in water elevations. This makes it difficult for native fisheries to reproduce successfully. However, the reservoir is home to a number of native species including northern pike (*Esox Lucius*), bull trout (*Salvelinus confluentus*), mountain whitefish (*Prosopium williamsoni*), lake whitefish (*Coregonus clupeaformis*), and longnose suckers (*Catostomus catostomus*).

While the proposed project would include in-stream work and may result in a short-term localized turbidity in Swiftcurrent Lake and Swiftcurrent Creek within the immediate vicinity of the bridge, the anticipated effects of these actions would not have any meaningful impact on downstream fish habitat. Impacts to fisheries are therefore dismissed and not analyzed further.

### **Vegetation**

The NPS strives to maintain all components and processes of naturally evolving park unit ecosystems, including the natural abundance, diversity, and ecological integrity of plants (NPS 2006). Vegetation near the Swiftcurrent Bridge site is characterized by forested subalpine fir and lodgepole pine communities with adjacent fescue grasslands. The immediate bridge site is previously disturbed with no existing vegetation. Because the project activity would be limited to an existing disturbed area generally free of vegetation, impacts to vegetation have been dismissed from further analysis.

### **Air Quality**

The Clean Air Act provides for special protection of air quality and air resources

in all National Park Service units. Section 118 of the Clean Air Act requires parks to meet all federal, state, and local air pollution standards. Glacier is classified as a mandatory Class I area under the Clean Air Act, where emissions of particulate matter and sulfur dioxide are to be restricted. Air quality is considered good in Glacier National Park. There are no metropolitan areas within 125 miles of the park, and no regional smog typical of highly populated areas with a high amount of vehicle traffic. Air quality would not be measurably affected by the proposed bridge replacement. Impacts to air quality are therefore dismissed and not further analyzed.

### **Soils**

The NPS preserves the soil resources of parks and protects those resources by preventing unnatural erosion, physical removal, or contamination (NPS 2006). The Swiftcurrent Bridge site is primarily characterized by rocky and sandy alluvial forest soils (Dutton 1989). Excavation associated with the proposed project would be primarily limited to the existing roadway and previously disturbed areas. Any topsoil encountered would be conserved and replaced onto slopes. Impacts to soil would be minor or less and are therefore dismissed from further analysis.

### **Wetlands**

The definition of wetlands under the Clean Water Act is “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas.” Executive Order 11990 Protection of Wetlands requires federal agencies to avoid, where possible, adversely impacting wetlands. Further, Section 404 of the Clean Water Act authorizes the USACE to prohibit or regulate the discharge of dredged material, fill material, or excavation within U.S. waters. NPS policies for wetlands as stated in 2006 *Management Policies* and Director’s Orders 77-1 *Wetlands Protection* strive to prevent the loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. In accordance with DO 77-1, the potential adverse impacts of proposed actions must be addressed in a separate statement of findings (SOF). There are no wetlands in the project area. This impact topic has therefore been dismissed and an SOF has not been prepared.

### **Visual Resources**

The Many Glacier developed area, which includes the Many Glacier Hotel and the Swiftcurrent Bridge, offers stunning views of the Many Glacier Valley, including Swiftcurrent Lake, Swiftcurrent Falls, and a spectacular mountain landscape. The original Swiftcurrent Bridge was designed with the area’s visual aesthetics in mind, and includes attributes such as a low profile deck and railings intended to lessen the appearance of a dam. The new bridge would be designed to retain those design characteristics. Although the depth of the concrete slab beams would be greater than that of the historic concrete slab, the sidewalks on both sides of the new bridge would be cantilevered 24 inches from the beams to mimic the 12-inch depth of the existing slab. The sides of the exterior beams would be dark colored concrete. The new metal guardrail would be similar to

the historic rail in design and materials, but would meet current code requirements. The concrete wing walls of the new bridge would have a masonry veneer, visually linking them to the adjacent natural and historic landscape.

The utilities that currently hang alongside the bridge's deck are not historic, and their relocation would benefit visual resources in the immediate area. Because the ongoing deterioration of the existing bridge could eventually detract from the site's visual aesthetics, replacing it with a new structure that retains the well-conceived, aesthetically sensitive and visually pleasing design characteristics of the historic bridge would benefit visual resources. The project would require the short-term presence of construction equipment at the bridge site during project implementation, but the visual effect would be temporary and would not permanently impact the surrounding viewshed. The majority of the work would also be scheduled during periods of low visitor use. Because effects to visual resources would be localized to the Swiftcurrent Bridge site, would be compatible with existing development, and would not alter the essential visual character of the area, impacts from the project would not exceed a minor level. Therefore impacts to visual resources have been dismissed and will not be further analyzed.

### **Socioeconomic Resources**

The proposed project may require an early closing of the Many Glacier Hotel during bridge demolition and construction in the fall, and an early end of season shut down for horseback rides and boat and hotel concessions. One-time early closures during a low visitor use period would not appreciably change the overall number of visitors utilizing concession operations and the general area, and local businesses would not be impacted. Socioeconomic resources would not be measurably affected by the proposal. The topic is therefore dismissed from further analysis.

### **Cultural Resources**

The following cultural resource topics were dismissed from further analysis:

#### **Archeological Resources**

The proposed action is not expected to impact archeological resources. The perimeter of Swiftcurrent Lake was surveyed for archeological sites in 1993 (Reeves 1995). The bridge is within an area previously disturbed by construction activities. However, an additional archeological survey would be conducted prior to new ground disturbance. If archeological resources are identified, consultation would occur in accordance with federal legislation and regulations and NPS policy. Impacts to archeological resources would be negligible or less and are therefore dismissed from further analysis.

#### **Ethnographic Resources**

Ethnographic resources are defined by the NPS as "the cultural and natural features of a park that are of traditional significance to traditionally associated peoples" (NPS 2006). The proposed action is not expected to impact ethnographic resources. Neither the Blackfoot nor the Confederated Salish and Kootenai Tribes raised concerns about the proposed project during scoping, and ethnographic resources have been dismissed from further analysis. However, Glacier National Park recognizes that the tribes hold a body of knowledge that

may result in the identification of ethnographic resources in the area in the future.

### **Museum Collections**

According to the NPS *Management Policies* (2006) Director's Order 24 *Museum Collections*, the NPS requires consideration of impacts on museum collections (historic artifacts, natural specimens, and archival and manuscript materials). NPS policy defines museum collections management including policy, guidance, standards, and requirements for preservation, protection, documentation, access, and use. Museum collections would not be affected by this project and are dismissed from further analysis.

### **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-agriculture uses. There are no prime and unique farmlands located within Glacier National Park (NPS 1999); this topic is therefore dismissed from further analysis.

### **Human Health and Safety**

The NPS *Management Policies* (2006) state that the safety and health of all people are core Service values. Public health is addressed in Director's Order 83 *Public Health and Vector-borne and Zoonotic Disease* and employee health is addressed in Director's Order 50 B *Occupational Health and Safety Program*. These policies call for risk recognition and early prevention for a safe work and recreational environment, and the NPS is committed to eliminating and reducing health and safety risks when they are identified. There would be no impacts to human health and safety from either alternative. Should the bridge not be replaced, more frequent bridge inspections would occur to monitor its condition, and access would be reduced or closed if a risk to health and human safety is identified. If the action alternative is implemented, all activities would be performed in a manner that ensures the safety of construction and park staff and park visitors. As all potential risk to health and human safety is mitigated under either alternative, the topic is dismissed from further analysis.

### **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. Disproportionate health or environmental effects on minorities or low-income populations or communities as defined in the *Environmental Protection Agency's Environmental Justice Guidance* (1998) would not occur from actions proposed in the preferred alternative. Therefore, environmental justice is dismissed from further analysis.

### **Recommended Wilderness**

Glacier National Park completed a wilderness suitability study and environmental impact statement in 1973 to comply with the 1964 Wilderness Act. That document recommended that over 90% of the park be designated as

wilderness. President Nixon forwarded the recommendation to Congress on June 13, 1974. A bill was subsequently introduced to designate the selected lands as wilderness. The bill has not been enacted, but since that time, the lands have been defined as recommended wilderness and managed by the NPS as designated wilderness. NPS policy requires the management of proposed or recommended wilderness as designated wilderness until the land is either formally designated or rejected. Amendments to the original proposal made in 1984 and 1994 increased the amount of recommended wilderness to 95 % of the park's total area. Wilderness in Glacier National Park is defined as lands that are essentially undeveloped or are natural in character and lie at least 100 feet from the centerline of established roadways and 300 feet from developed areas. The proposed activities for this project would have no effect on recommended wilderness, as actions would not intrude on the proposed wilderness boundary; therefore this topic is dismissed from further analysis.

### **Night Skies**

In accordance with 2006 *Management Policies*, the NPS strives to preserve natural night skies and will “minimize light that emanates from park facilities, and also seek the cooperation of park visitors, neighbors, and local government agencies to prevent or minimize the intrusion of artificial light into the night scene of the ecosystems of parks”. Glacier National Park considers the impacts to night skies for all projects. Due to a very short timeframe, work activity for the Swiftcurrent Bridge replacement would likely be scheduled 24 hours a day, seven days a week. Night work is therefore anticipated. Heavy duty work lights would be used during night work to illuminate the bridge site. Depending on the number of necessary lights, glare and light scatter could be visible beyond the project area. The light could interfere with dark sky visibility in the vicinity of the foot of Swiftcurrent Lake, and possibly the upper portion of the Many Glacier Valley, thereby diminishing opportunities for late-season visitors to the area to view the night sky. As the work progresses into the fall, at a time when daylight hours steadily decrease and nights become longer, adverse impacts to night sky visibility would occur over an increasing number of hours. These impacts would be temporary, ceasing once the project is completed. The work would occur at a time when park concessioners have closed for the season and visitor use is lower than in the summer months. Work lights would be shielded to help direct artificial light downward and minimize the amount of upward light scatter, thus mitigating impacts to night skies. Because adverse effects to night skies would be temporary and generally localized, and since they would occur during a low visitor use period, impacts to night skies would be minor or less and are dismissed from further analysis.

### **Climate**

The Intergovernmental Panel on Climate Change (IPCC) predicts “impacts of climate change will vary regionally but, aggregated and discounted to the present, they are very likely to impose net annual costs which will increase over time as global temperatures increase” (IPCC 2007). The proposed project is of a small scale, would not change visitor use patterns, is not likely to result in increased or reduced greenhouse gas emissions, and therefore is not expected to measurably impact the global climate. Climate change has therefore been dismissed from further analysis.

## Alternatives

An interdisciplinary team of Glacier National Park staff has identified two alternatives, no action and replace the Swiftcurrent Bridge, which have been carried forward for further evaluation. Preservation of the existing bridge was considered but dismissed as described under *Alternatives Considered but Eliminated from Detailed Study*.

### Alternatives Carried Forward

#### Alternative A: No Action Alternative

The no action alternative describes the conditions that would continue to exist at the bridge site if no plan was implemented. This alternative provides a baseline for evaluating the changes and related environmental impacts that would occur under the action alternative. Under no action, the Swiftcurrent Bridge would not be replaced. Over time, the bridge would deteriorate to a point where it would no longer safely support vehicles, and vehicular traffic across the bridge would be limited or halted altogether. If the structural deterioration of the bridge also leads to unsafe conditions for equestrian or pedestrian traffic, then all access across the bridge to the Many Glacier Hotel and concession services and recreational opportunities associated with the Many Glacier developed area may be prohibited entirely. Visitor access to a significant historic resource would be severely limited, and the deteriorated appearance of the bridge would eventually degrade the visual character of the Many Glacier Hotel Historic District.

#### Alternative B: Replace the Swiftcurrent Bridge (Preferred)

Under Alternative B, the existing 75-foot, 5-span, reinforced concrete slab Swiftcurrent Bridge would be replaced with an 85-foot single span, concrete slab beam bridge on the existing alignment (Figure 3). The four interior piers and existing abutments would be removed to somewhat improve the bridge's hydraulic capacity. New abutments would be constructed at the outer edges of the stream channel just beyond the position of the existing abutments. The new bridge would be supported on deep foundations, which would require the installation of piles. The new deck and abutments would be pre-fabricated off site and hauled to the bridge site. Utilities would be reorganized and contained within the new bridge to reduce safety hazards, improve aesthetics, and comply with applicable codes.

The new bridge would be designed to preserve to the extent possible the primary visual and aesthetic elements of the historic bridge, including its near elevation to approximately match the existing historic profile. Although the depth of the concrete slab beams would be greater than that of the historic concrete slab, the sidewalks on both sides of the new bridge would be cantilevered 24 inches from the beams to mimic the 12-inch depth of the existing slab. The sides of the exterior beams would be dark colored concrete. The bridge's wing walls would be constructed with stone masonry and concrete, blending with the historic landscape. The new bridge would match the existing bridge width of 28 feet-8 inches, and would replicate two 9-foot lanes, a 3-foot wide sidewalk, and a 5-foot wide bridle path; the sidewalk and bridle path would be separated from vehicle traffic with curbing. The existing railings would be replaced with new railings of similar design to the historic, but with modifications to height and baluster spacing so that they meet current codes.

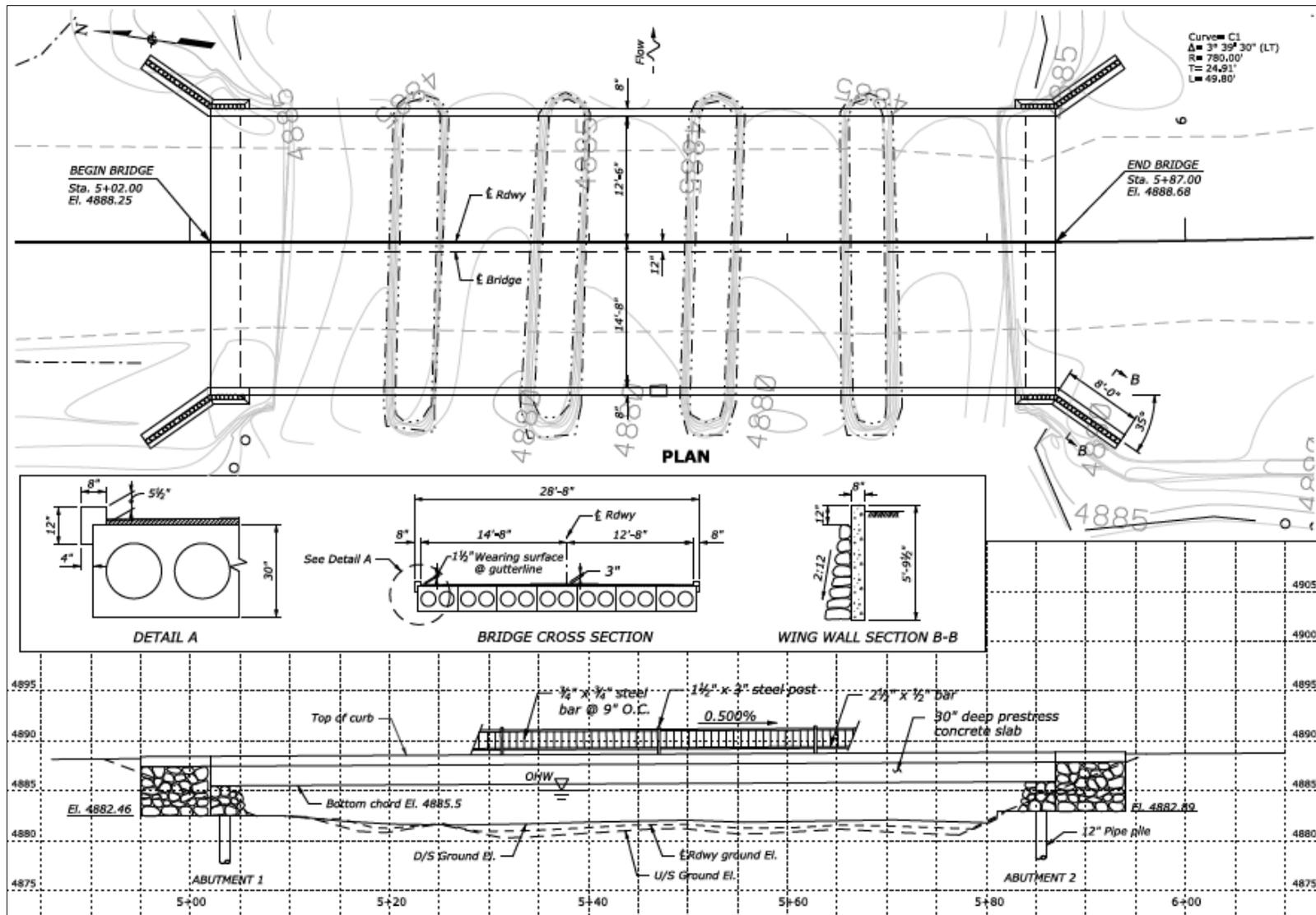


Figure 3: Proposed bridge schematic

The existing bridge deck may be removed without the need for work crews or equipment to access the creek, but some in-water work involving an excavator or other like equipment would be required to remove the stone piers and salvage masonry for reuse, though no excavation of the lake bed would occur. Riprap would be placed at the new abutments to reduce the potential for stream flow and ice scour at the abutments to protect roadway embankments.

The riprap would likely be in the class 5 size category (20 by 28 inches, approximately), based on hydraulic analysis of the stream at the bridge site. The riprap would be placed over a geotextile mat and a thinner layer of smaller sized riprap to securely set the larger stones on the streambed. Limestone and smaller sized riprap would be incorporated onto the larger riprap to visually tie it into the historic character and aesthetics of the surrounding landscape.

The large-scale demolition and construction associated with the replacement of the Swiftcurrent Bridge is anticipated to occur in the fall of 2014, from late September through the first week of December. Unforeseen circumstances, primarily severe late season weather, could necessitate some work in the spring of 2015, such as stone masonry and low intensity deck work (the installation of bridge railings, for example). Remaining masonry construction, roadway preparation, and paving required to complete the project would occur in late summer/early fall of 2015. This final phase of the project is expected to require eight weeks or less (approximately).

In order to reduce impacts to visitors and concessioners, the bridge replacement must be completed within a narrow timeframe. Bridge work would not begin until late September, after the Many Glacier Hotel and other concessions close for the season, and would proceed through the first week of December. Work would not occur during the winter months; access across the bridge must therefore be reestablished prior to shutting the project down for the winter so that the bridge is accessible when the Many Glacier Road reopens to visitor traffic in the spring of 2015. Given the narrow project timeframe, bridge demolition and construction may be scheduled to occur twenty-four hours a day, seven days a week. The access road to the Many Glacier developed area and the Many Glacier Hotel would be closed to all traffic during the September-December work period. Completion work during the late summer/early fall of 2015 would be limited to daytime hours; access to the Many Glacier developed area, including the hotel would remain open during this time.

Over the duration of the project, work would occur within the immediate vicinity of the bridge, with some staging of materials and equipment on the adjacent roadway and at nearby parking areas and turnouts, including the turnout at Sheep's Curve and portions of the upper parking lot at Many Glacier Hotel. The Many Glacier Hotel upper parking lot would not be available for use during the summer/fall of 2015 to accommodate visitor use and hotel construction staging.

To facilitate ongoing construction projects and winterization procedures at the Many Glacier Hotel and Lake Josephine Boathouse, concessioners would use motorized boats to access these areas while the bridge is unusable.

## **Mitigation Measures**

The following mitigation measures would minimize the degree and/or severity of adverse effects and would be implemented during the project:

### *Fisheries and Water Resources*

- Best management practices would be implemented to ensure no pollutants enter the lake as a result of the project.

- Only biodegradable, vegetable-based hydraulic fluid would be used in excavators that may reach into Swiftcurrent Lake.
- All fueling would occur more than 100 feet from any surface water in a location where a fuel spill would not be able to enter the water. An exception to this would be for re-filling tracked equipment as the entire project length parallels open water. For this situation, two people would be required to monitor both the pump and fuel nozzle.
- Vehicles and equipment would be regularly inspected for leaks; any leaks would be repaired immediately.
- A fuel/lubricant spill absorption kit would be in place to address potential land and water spills and leaks.

#### *Wildlife and Federally Listed Species*

- Construction personnel would be orientated on appropriate behavior in the presence of wildlife and on proper storage and handling of food, garbage and other attractants.
- The bridge site and staging areas would be monitored by Glacier National Park wildlife monitors and/or law enforcement rangers throughout the duration of the project.
- Sheep's Curve pullout, located within a heavily used wildlife travel corridor, would only be used as an overflow staging area, when there is insufficient space to stage materials and equipment at the bridge site. When in use for staging, the pullout would be inspected by park staff daily.
- Hauling vehicles greater than 20,000 gvw travelling the Many Glacier Road within the park boundary at night would be limited to speeds 10 mph below the posted speed limit to avoid collisions with wildlife.
- Onsite wildlife monitors and/or park law enforcement rangers would monitor hauling and escort nighttime hauling trucks from the park entrance to the project area whenever possible (subject to logistics associated with haul times and staff availability, for example).
- If work is necessary in the spring, it would not begin until after March 31, in accordance with the Many Glacier Road closure and the core security period for wildlife protection.

#### *Vegetation*

- Glacier National Park's Best Management Practices would be implemented to minimize the extent of impacts.
- Disturbance to vegetation would be avoided as much as possible and contained to as small a footprint as possible while meeting project objectives.
- Non-native invasive plant infestations near the bridge would continue to be treated on a yearly basis, with emphasis on the disturbed area for a minimum of three years following project completion.
- All equipment entering the park would be inspected and may be required to be pressure washed to remove foreign soil, vegetation, and other materials that may contain non-native seeds or vegetation.

### Soils

- Glacier National Park's Best Management Practices would be implemented to minimize the extent of impacts.
- Disturbance to soils would be avoided as much as possible and contained to as small a footprint as possible while meeting project objectives.
- Erosion control measures that provide for soil stability and prevent movement of soils into waterways would be implemented.
- Any topsoil temporarily disturbed during construction would be aerated and replanted with native vegetation to reduce compaction and prevent erosion.
- Any disturbed top soil would be salvaged, stored, and used to restore the area.

### Historic Structures and Cultural Landscapes

- The new Swiftcurrent Bridge would be designed to be compatible with the Many Glacier Hotel Historic District.
- The Memorandum of Agreement (MOA) documenting mitigation requirements for the adverse effect to the Swiftcurrent Bridge would be signed with the Montana SHPO. Measures anticipated to be included are Historic American Engineering Record documentation of the existing bridge and interpretive signs. (See Appendix A for the draft MOA).
- The park's Historic Landscape Architect would monitor the work and serve as a liaison between FHWA personnel administering the contract and Glacier National Park.

### Visitor Use and Experience

- Bridge demolition and construction would not begin until late September, after the peak visitor season and traffic on the Many Glacier Road is at a decreased level. Work occurring the following year after bridge demolition and construction would allow for traffic along Many Glacier Road and access across the bridge to the Many Glacier Hotel.
- Equipment and materials would not be staged at turnouts that could be used by visitors during time periods when the Many Glacier Road is open to public vehicles. Sheep's curve would be available for staging purposes, and the upper parking lot at Many Glacier Hotel would also be available for staging except for summer/fall of 2015.
- Signs would be posted at trailheads along hiking trails in the area alerting hikers to detours around the project area.

### Night Skies

- Work lights would be shielded to direct the light downward and minimize the amount of upward light scatter.

### Park Operations

- Concession operators in the Many Glacier area would be invited to appropriate preconstruction and orientation meetings to better inform any concessioner operational adjustments that would be needed.
- Concessioner access to properties on the opposite side of the bridge via motorized boat would occur during daylight hours, unless preapproved by the NPS.

- Boat fueling procedures would be developed by the concessioner or contractor in advance for NPS review and approval. Procedures would comply with applicable federal regulations and other NPS approved environmental management plans.
- The NPS would develop emergency response protocols for the Many Glacier Hotel and other properties on the other side of the bridge for the time that the bridge is not in place.
- Generator fuel necessary for winterization and maintenance activities would be staged in advance of bridge demolition. Additional fuel transportation requirements would be approved by the NPS prior to transport.

## Alternatives Considered but Eliminated from Detailed Study

Preservation of the existing bridge was considered but has been dismissed as described below:

**Preserve the existing bridge and bridge elements in place.** Preserving the existing bridge or selected bridge elements in place was considered (leaving the original piers in place beneath a single span bridge, with no load on the piers, was considered, for example). Preserving the existing bridge and/or elements was deemed infeasible, however, as documented in the previously referenced inspection reports. The existing bridge and bridge elements including fabric and overall structural integrity have deteriorated to a point where retaining them was determined not to be possible, as the elements are not suitable for reuse.

## Alternatives, Suggestions, and Concerns from Public Scoping

Four comment letters were received during scoping. Two letters outlined regulatory requirements for the proposed project, two letters were supportive, and none were opposed. Concerns and suggestions received are addressed below.

**Comment:** The replacement work has to be done outside of the operating season as there would be no safe way to get guests and horses across while the bridge is under construction.

**Response:** The timing of the proposed project is described under *Alternatives Carried Forward, Alternative B*. Demolition and construction of the bridge would not begin until late September, 2014 after the concession's operating season concludes. Additional work such as paving and stone masonry would be completed in late summer/fall the following season while accommodating traffic, including pedestrians. Construction work during summer/fall 2015 would cease in the morning and evening to accommodate two equestrian bridge crossings. All day and half day rides that normally cross the bridge throughout the day would require operational changes possibly including different departure locations, schedules, or alternate trails to ensure horse and rider safety. The horse concessioner would be invited to appropriate preconstruction and orientation meetings to better inform any concessioner operational adjustments that would be needed.

**Comment:** The new bridge must be built keeping horses in mind. This includes ensuring there is a specific lane for the horses to use or at minimum, very good signage that explains that horse crossings are frequent and horses have the right of way. The bridge needs to be safe for horse crossings (i.e. no large gaps where a horse could fall through, etc.). **Response:** The proposed new bridge design is described under *Alternatives Carried Forward, Alternative B*. As with the existing bridge, the new bridge would include a 5-foot wide bridle path separated from vehicle traffic with curbing. Necessary signage would be installed to ensure safe conditions for all traffic, including equestrian.

**Comment:** Ensure proper time is allowed once the bridge has been completed, but before the season opens to the public to allow the horses to cross the bridge multiple times and get used to

the new structure. One week should be adequate for this purpose. **Response:** The bridge would be accessible before concession operations begin for the 2015 season, with time for horses to get familiar with the new structure. Additional construction work in late summer/fall of 2015 would require operational adjustments referenced in the response to the first comment in this section.

**Comment:** All considerations should be taken to ensure the replacement bridge also fits with that historic NPS design philosophy, including, if necessary, consultation with the U.S. Commission of Fine Arts as well as the Montana State Historic Preservation Office. We believe the park must maintain historic design features including the original steel handrails, low profile and a thin deck, to achieve the goal of providing uninterrupted views and preventing the bridge from having the appearance of a “dam.” **Response:** Consultation is ongoing with the Montana State Historic Preservation Office. The Advisory Council on Historic Preservation has also been notified of the adverse effect finding for the proposed project. As described under *Alternatives Carried Forward, Alternative B*, the bridge design would be compatible with the historic architectural characteristics of the area and would be similar to the existing structure, though the railing and utilities would be brought into compliance with current code.

**Comment:** The park also must consider the effect that bridge replacement work will have on fish and other aquatic species. Specifically, the park must take into account fish migration and movement within the Swiftcurrent drainage and lake system; this means careful attention not only to design but also to the timing of the bridge replacement. **Response:** Impacts to water quality are anticipated to be localized to the immediate vicinity of the existing bridge, at the outlet of Swiftcurrent Lake above Swiftcurrent Falls, which precludes fish passage. Given the bedrock present throughout the area, removal of the existing piers and placement of riprap (the only proposed in-water activities) would be expected to generate very minor turbidity that would not impact fish migration or movement within the lake or downstream.

**Comment:** While taking into account the visual aspect of the bridge, the park must also consider how the bridge will withstand high-water events and spring breakup of Swiftcurrent Lake. The loss of historic character of the bridge (due to the proposed design change from four mid-creek stone pillars to none), while unfortunate, should help minimize bridge damage when ice is moving out of the lake. We would encourage the park to ensure that the abutments and any streamside mitigation for construction not only match the landscape but also prove strong enough to withstand any high-water events. **Response:** The proposed bridge design is described under *Alternatives Carried Forward, Alternative B*. The new abutments would be founded on piles anchored within bedrock. This is a more robust design than that of the existing abutments, which have also withstood past high water events. Additional hydrologic studies were conducted and indicated that hydrologic capacity at the bridge site would be somewhat improved with the new design but spring flooding may continue to flow over the bridge due to the low profile.

**Comment:** The park needs to time the replacement of the bridge so as to minimize impacts to visitor experience at Many Glacier Hotel and the surrounding area. The proposal of waiting until after the area is closed for the season is sound, however timing also must be balanced with considerations of wildlife, fish migrations and whether bridge replacement can realistically be completed between the closing of the Many Glacier area and the onset of winter. **Response:** The project schedule is described under *Alternatives Carried Forward, Alternative B*; impacts to wildlife are discussed under *Affected Environment and Environmental Consequences, Wildlife*; and effects to fisheries are described under *Impact Topics Dismissed from Further Analysis*. Bridge construction is expected to be completed in the fall, but may continue in the spring if delayed by unforeseen circumstances, such as severe late season weather conditions.

## Alternative Summaries

Table 2 summarizes the major components of Alternatives A and B and compares the ability of these alternatives to meet the project objectives (as identified in the *Purpose and Need*). As shown, the no action alternative only partially achieves one of the project objectives, while the preferred alternative fully achieves three of the four project objectives and partially achieves one.

Table 2: Summary of alternatives and how each alternative meets project objectives.

Alternative Elements	Alternative A – No Action	Alternative B – Preferred
Swiftcurrent Bridge	The bridge would not be replaced and would continue to deteriorate over time.	The existing 75-foot, 5-span, reinforced concrete slab bridge would be demolished and replaced with an 85 foot, single span, concrete slab beam bridge on the existing alignment.
Access and visitor use	Access across the Swiftcurrent Lake outlet to the Many Glacier developed area, including the Many Glacier Hotel, would eventually be prohibited. Visitors to Many Glacier would lose opportunities to experience one of the park's most popular sites, notable for its cultural significance, scenic vistas, and numerous visitor services.	Access across the Swiftcurrent Lake outlet to the Many Glacier developed area, one of the park's most popular sites notable for its cultural significance, scenic vistas, and numerous visitor services, would be maintained. Visitor access to the area would be temporarily limited during bridge demolition and construction. Construction is scheduled during the shoulder season to reduce access impacts.
Hydrologic capacity	Existing constrictions to flood flows from the bridge would continue.	Removing the existing bridge's four interior piers and relocating the abutments farther from the stream bank would somewhat improve flood flows. Due to the low profile, high flows would still go over the bridge deck.
Characteristics of the historic district	There would be no changes to the characteristics of the Many Glacier Hotel Historic District.	The demolition of the existing bridge would remove a contributing resource from the Many Glacier Hotel Historic District.
Project Objectives	Meets Project Objectives?	Meets Project Objectives?
Maintain access across the Swiftcurrent Lake outlet to the Many Glacier developed area and Many Glacier Hotel.	No. Over time, vehicle access across the Swiftcurrent Lake outlet to the Many Glacier Hotel and Many Glacier developed area would be prohibited. Pedestrian and equestrian access over the bridge could also eventually become severely limited or prohibited.	Yes. Vehicle, pedestrian, and equestrian access across the Swiftcurrent Lake outlet to the Many Glacier developed area and Many Glacier Hotel would be maintained.
Maintain the historic character of the Many Glacier Hotel Historic District and minimize adverse impacts to historic properties to the extent possible.	No. Continued deterioration of the Swiftcurrent Bridge and associated features would detract from the historic character of the Many Glacier Hotel Historic District. The neglect of a property which causes its deterioration is an adverse effect under Section 106.	Yes and No. The demolition of the Swiftcurrent Bridge would remove a contributing resource to the Many Glacier Hotel Historic District. The new bridge would be designed to blend with the landscape, thereby preserving some of the visual and aesthetic characteristics of the original bridge.

Address safety concerns associated with the severely deteriorated bridge, including non-code compliant utility lines.	No. The structural integrity of the existing Swiftcurrent Bridge would deteriorate to a point where the bridge would no longer safely support vehicles. The structural deterioration of the bridge may also lead to unsafe conditions for equestrian or pedestrian traffic. Utilities would remain suspended in a non-code compliant position alongside the bridge's deck and beneath the sidewalk.	Yes. A clear span bridge with new abutments on piles and anchored within bedrock would replace the existing, structurally deteriorated bridge. Utilities would be contained within or under the new bridge deck to reduce safety hazards, improve aesthetics, and comply with applicable codes.
Minimize adverse effects to natural resources and protect natural stream and floodplain processes.	Yes and no. The existing constriction to flood flows presented by the Swiftcurrent Bridge would continue; hydrologic issues would continue, with limited capacity at the bridge to handle high water. Other natural resources would not be affected by no action.	Yes. Replacing the existing Swiftcurrent Bridge with a clear span bridge and locating the new abutments farther from the stream would somewhat decrease flood flow constriction and increase channel and hydraulic capacity during high water. Mitigation measures identified in this EA would minimize adverse effects to other natural resources.

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

**Table 3:** Impacts on resource topics under each alternative.

Impact Topic	No Action Alternative	Preferred Alternative
<b>Historic Structures and Cultural Landscapes</b>	Moderate, adverse, site-specific to local, and long-term impacts to historic structures and cultural landscapes would occur due to the eventual deterioration of the bridge, which is a contributing resource to the Many Glacier Hotel Historic District.  For Section 106 purposes, the finding of effect would be adverse.	Moderate, adverse, long-term, and site-specific to local impacts to historic structures and cultural landscapes would occur due to the demolition of the Swiftcurrent Bridge, which is a contributing resource to the Many Glacier Hotel Historic District.  For purposes of Section 106, the finding of effect would be adverse.
<b>Visitor Use &amp; Experience</b>	Adverse, moderate to major, site-specific to widespread and possibly regional, and long term impacts would occur. Eventually vehicles would no longer be able to access the Many Glacier Hotel and associated developed area, and pedestrian and equestrian access could be limited as well.	Moderate, long-term, and site-specific to widespread and possibly regional beneficial impacts would occur by ensuring continued access to the Many Glacier Hotel and associated developed area.  Short-term, minor to moderate, site-specific adverse impacts due to noise, disturbance, and temporarily limited access to the project area would occur.
<b>Floodplains</b>	No new impacts. Existing adverse, minor, long-term, and site-specific impacts from constrictions to flood	Negligible to minor, site-specific, and long-term beneficial impacts to the Swiftcurrent Lake/Creek

Impact Topic	No Action Alternative	Preferred Alternative
	flows from the road and bridge would continue.	floodplain would occur by reducing flood flow constriction caused by the existing bridge's piers and abutments.
<b>Water Resources</b>	No impacts.	Negligible to minor, adverse, site-specific, and short-term impacts would occur due to limited turbidity associated with the removal of the Swiftcurrent Bridge's existing piers and abutments and placement of new abutments and riprap.
<b>Wildlife</b>	No impacts.	Site-specific to local, short-term, and negligible to minor adverse impacts would occur due to human activity, construction, and vehicle traffic, as wildlife travel to and forage in the vicinity of the Swiftcurrent Lake outlet.
<b>Grizzly Bears (threatened species)</b>	No impacts.  Under Section 7, the determination for grizzly bears would be "no effect".	Site-specific to local, short-term, and minor to moderate adverse impacts would occur due to disturbances from human activity including construction and vehicle traffic. Impacts from completion work the following summer/fall would be minor due to the reduced intensity of the work and the absence of nighttime construction.  The Section 7 determination for effects to grizzly bears is "may affect, not likely to adversely affect".
<b>Canada lynx (threatened species)</b>	No impacts.  Under Section 7, the determination for Canada Lynx would be "no effect".	Site-specific to local, short-term, and minor to moderate adverse impacts would occur due to disturbances from human activity including construction and vehicle traffic. Impacts from completion work the following summer/fall would be minor due to the reduced intensity of the work and the absence of nighttime construction.  The Section 7 determination for effects to Canada lynx is "may affect, not likely to adversely affect".
<b>Wolverine (proposed for listing)</b>	No impacts.  Under Section 7, the determination for wolverine would be "no effect".	Site-specific to local, short-term, and minor to moderate adverse impacts would occur due to disturbances from human activity including construction and vehicle traffic. Impacts from completion work the following summer/fall would be minor due to the reduced intensity of the work and the absence of

Impact Topic	No Action Alternative	Preferred Alternative
		nighttime construction. The Section 7 determination for effects to wolverine would be “not likely to jeopardize”.
Natural Soundscapes	No impacts.	Moderate adverse, site-specific to local, and short term impacts would occur due to a temporary increase in the level and occurrence of human-caused noise in the project area.

## **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.”

Overall Alternative A (no action) is the environmentally preferable alternative because there would be no activities that would disturb elements of the biological and physical environment. However, while there would be no new adverse impacts to floodplains, the existing constriction to flood flows presented by the bridge and the road would continue and project objectives would not be achieved.

Alternative B (replace the Swiftcurrent Bridge) is not the environmentally preferable alternative because it would demolish the historic Swiftcurrent Bridge, a contributing feature to the Many Glacier Hotel Historic District; temporarily disturb and possibly displace wildlife, including the threatened grizzly bear and Canada lynx and the proposed threatened wolverine; and temporarily disturb the natural soundscape.

While Alternative B is not the environmentally preferable alternative, it would best accomplish the purpose and need of the proposal and would not significantly impact (cause major effects to) affected cultural and natural resources. Alternative B would provide for visitor use and enjoyment, which, in addition to resource conservation, is in accordance with the 1916 Organic Act for the National Park Service. Through mitigation measures and project design, Alternative B would achieve a balance between visitor use and enjoyment and conservation of park resources. Department of the Interior (DOI) regulations do not require that the environmentally preferable alternative be selected as the NPS preferred alternative (DOI 43 CFR Part 46, Implementation of the National Environmental Policy Act of 1969, § 46.420).

## **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 alternative that best meets the project objectives and is therefore the NPS 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 in Table 4 and at the beginning of each resource section.

- **Type** describes the classification of the impact as either 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 effect that is caused by an action and occurs in the same time and place.
  - *Indirect*: An effect that is caused by an action but is later in time or farther removed in distance, but is still reasonably foreseeable.
- **Spatial Context** describes the area or location in which the impact would occur. Effects may be 1) *site-specific* – at the location of the action, 2) *local* – on a drainage or district-wide level, 3) *widespread* – throughout the park, or 4) *regional* – outside of the park.
- **Duration** describes the length of time an effect would occur, either short-term or long-term. The definitions for these periods depend upon the impact topic and are described in Table 4.
- **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 and are also provided in Table 4.

### 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 Glacier National Park and, if applicable, the surrounding area. Because the scope of this project is relatively small, the

geographic scope of the cumulative analysis is generally limited to the vicinity of the Swiftcurrent Bridge site and Many Glacier developed area, Swiftcurrent Lake, the Swiftcurrent developed area, and the Many Glacier Road. The temporal scope includes the last ten and upcoming five years, approximately. Given this, the following projects were identified for the purpose of conducting the cumulative effects analysis:

#### **Past Actions**

- Projects identified under the 2004 *Commercial Services Plan*, including:
  - Upgrades to existing trails, walkways, and parking areas.
  - Improvements to approach roads and pedestrian access around the Many Glacier Hotel.
  - Exterior rehabilitation of the Many Glacier Hotel, and interior rehabilitation of the hotel's north annex and dining room. This was a large scale project to restore exterior and interior finishes and perform life safety and health improvements.

#### **On-going Actions**

- Projects identified under the 2004 *Commercial Services Plan*, including:
  - Continued upgrades to the Many Glacier Hotel and other facilities and utilities in compliance with safety, accessibility, and building codes.
  - Rehabilitation and restoration of the interior of the Many Glacier Hotel.
  - Upgrades to concession employee housing and parking at the Upper Dormitory.
  - Improvements to water and wastewater utility infrastructure.
  - Construction of new cabins at the Swiftcurrent Motor Inn.
- Routine road maintenance, including ditch clearing, and seasonal snow plowing along the Many Glacier Road.
- New guest cabins in the vicinity of the Swiftcurrent Motor Inn.

#### **Future Actions**

- Projects identified under the 2004 *Commercial Services Plan*, including:
  - Exterior rehabilitation of the Many Glacier Hotel and interior rehabilitation of the hotel's south annex and lobby. This will be a large scale project to restore exterior and interior finishes and perform life safety and health improvements.
  - Upgrades to existing trails, walkways, and parking areas.
  - Modifications to housing, including construction of new guest and concession employee housing, conversion of employee housing to guest accommodations, and conversion of guest to employee housing.
  - Modifications to concession employee parking areas and recreation facilities.
- Rehabilitation of the Apikuni and Windy Creek Bridges, involving low intensity concrete and stone masonry repair and deck sealing.
- Implementation of the Many Glacier Wildlife Viewing Plan, including construction of a wildlife viewing platform at the Swiftcurrent Motor Inn parking lot and the enlargement and/or improvement of heavily used pullouts in popular wildlife viewing area (changes to pullouts may occur during rehabilitation of the Many Glacier Road).

- Rehabilitation of the Many Glacier Road. This would be a large scale repair of road slumping and slide areas, and would include a pavement overlay. Changes to pullouts called for under the Many Glacier Wildlife Viewing Plan may occur under this project.
- Construction of additional park employee housing in the Many Glacier housing area.

**Table 4:** Definitions for intensity levels and duration.

Impact Topic	Negligible	Minor	Moderate	Major	Duration
<b>Historic Structures and Cultural Landscapes</b>	Treatment is at the lowest levels of detection – barely perceptible and not measurable. For purposes of Section 106, the finding of effect would be no adverse effect.	Treatment would affect the character defining features of a National Register of Historic Places eligible or listed property, but is in accordance with the Secretary of the Interior’s Standards. For purposes of Section 106, the finding of effect would be no adverse effect or adverse effect.	Treatment would alter a character defining feature(s), diminishing the integrity of the resource to the extent that it is no longer eligible for listing in the National Register of Historic Places. For purposes of Section 106, the finding of effect would be adverse effect.	Treatment would alter a character defining feature(s) of a National Historic Landmark, diminishing the integrity of the resource to the extent that its designation is threatened. For purposes of Section 106, the finding of effect would be adverse effect.	Short-term: Effects extend only through the period of construction  Long-term: Effects extend beyond the period of construction
<b>Visitor Use and Experience</b>	Visitors would not be affected or changes in visitor use and/or experience would be below or at the level of detection. The visitor would not likely be aware of the effects associated with the alternative.	Changes in visitor use and/or 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.	Changes in visitor use and/or experience would be readily apparent. The visitor would be aware of the effects associated with the alternative.	Changes in visitor use and/or experience would be readily apparent and have important consequences. The visitor would be aware of the effects associated with the alternative.	Short-term: Occurs only during project implementation or one month.  Long-term: Occurs after project implementation or is permanent.

Impact Topic	Negligible	Minor	Moderate	Major	Duration
<b>Floodplains</b>	Floodplains would not be affected, or changes would be either non-detectable or if detected, would have effects that would be slight and non-measurable. The change would have barely perceptible consequences to riparian habitat function.	Changes in floodplains would be measurable, although the changes would be small and the effects would be localized. The action would affect a few individual plants or wildlife species within an existing riparian area.	Changes in floodplains would be measurable, long-term and on a localized scale. Plant and wildlife species within the existing riparian area would experience a measurable effect, but all species would remain indefinitely viable.	Changes in floodplains would be readily measurable and have substantial consequences to floodplain dynamics and would be noticed on a localized scale within the watershed.	Short-term – After implementation, recovery would last less than one year.  Long-term – After implementation, recovery would last more than one year.
<b>Water Resources</b>	Neither water quality nor hydrology would be affected, or changes would be either non-detectable or if detected, would have effects that would be considered slight and non-measurable.	Changes in water quality or hydrology would be measurable, although the changes would be small and the effects would be localized.	Changes in water quality or hydrology would be measurable and would be noticeable on a widespread scale.	Changes in water quality or hydrology would be readily measurable, would have substantial consequences and would be noticed on a regional scale.	Short-term – After implementation, recovery would take less than 1 year.  Long-term – After implementation, recovery would take more than 1 year or effects would be permanent.

Impact Topic	Negligible	Minor	Moderate	Major	Duration
<b>Wildlife, Species of Concern, Special Status Species</b>	Effects would be at or below the level of detection and the changes would be so slight that they would not be of any measurable or perceptible consequence to wildlife species' populations.	Effects on wildlife species would be detectable, although the effects would be localized and would be small and of little consequence to the species' population.	Effects on wildlife species would be readily detectable and widespread, with consequences at the population level.	Effects on wildlife would be obvious and would have substantial consequences to species' populations in the region.	Short-term: After implementation, would recover in less than 1 year.  Long-term: After implementation, would take more than 1 year to recover or effects would be permanent.
<b>Terrestrial Threatened and Endangered Species (including grizzly bears, Canada lynx, and wolverine for the current proposal)</b>	The alternative would affect an individual of a listed species or its critical habitat, but the change would be so small that it would not be of any measurable or perceptible consequence to the protected individual or its population.	An individual(s) of a listed species or its critical habitat would be affected, but the change would be small.	An individual or population of a listed species, or its critical habitat would be noticeably affected. The effect could have some long-term consequence to individuals, populations, or habitat.	An individual or population of a listed species, or its critical habitat, would be noticeably affected and there could be a vital consequence to the population or habitat.	Short-term: After implementation, would recover in less than 1 year.  Long-term: After implementation, would take more than 1 year to recover or effects would be permanent.
<b>Natural Soundscapes</b>	Noise from the action would be below the level of detection and would not result in any perceptible consequences.	Noise from the action would be localized and rarely audible, and/or would occur for less than 1 month.	Noise from the action would be localized to widespread and periodically audible, and/or would occur for 1 to 3 months.	Noise from the action would be widespread, regularly audible, and/or would occur for more than 3 months.	Short-term: Would occur only during project implementation.  Long-term: Would be permanent or occur beyond project implementation.

## **Historic Structures and Cultural Landscapes Affected Environment**

The Swiftcurrent Bridge is listed as a contributing resource to the Many Glacier Hotel Historic District. The Many Glacier Hotel Historic District (24GL864) was listed in the National Register of Historic Places in 1976 with five buildings contributing to the district's significance. The Many Glacier Hotel itself was designated a National Historic Landmark under the "Architecture in the Parks National Historic Landmark Theme Study" in 1987. The National Register Nomination for the district was amended in 1996 and eleven additional resources were listed as contributing. In 2011, the park again amended the Many Glacier Hotel Historic District National Register Nomination, expanding the district's boundary to include the Many Glacier Road and associated resources. The Montana State Historic Preservation Office concurred with the park's determination that the road and seven resources met the criteria for listing in the National Register of Historic Places. The Swiftcurrent Bridge was one of the resources.

Located on the east shore of Swiftcurrent Lake, the Many Glacier Hotel was constructed in 1915, marking the beginning of the Many Glacier Hotel Historic District's period of significance. The history of the Many Glacier Road is closely associated with that of the hotel. The current alignment of the road was constructed from 1927 to 1931, when private automobiles were fast becoming a popular means for the American public to visit national parks. The Many Glacier Hotel was the original terminus for the Many Glacier Road and, at the time, was the sole concessioner-operated hotel in Many Glacier. The hotel soon became an important destination for visitors to the park.

The Swiftcurrent Bridge was constructed in 1929-30 as one of several improvements during construction of the Many Glacier Road. Located approximately 700 feet from the hotel at the outlet of Swiftcurrent Lake, the bridge was and remains the sole entry point to the hotel for motor vehicles, horses, and pedestrians. The first Swiftcurrent Bridge was constructed of wood and located just downstream of the current location.

The Bureau of Public Roads surveyed the Swiftcurrent Bridge site in 1928. The NPS Division of Landscape Architecture developed the original plans, which were approved by Chief Landscape Architect Thomas Vint. Ferruccio Vitale, a noted landscape architect with the U.S. Commission of Fine Arts, reviewed the bridge design. This was unusual, as the commission only occasionally visited parks and typically only reviewed designs for monuments and memorials.

The NPS hired day laborers to construct the bridge. Work began in September of 1929, and a camp was constructed nearby for the workers. Crews hauled sand and gravel from the shores of Lake Sherburne for the concrete and trucked stone in from a site near Babb for the rubble masonry. Work was temporarily suspended on November 20 due to unusually cold temperatures, but resumed on March 27, 1930. Construction of the bridge was completed two months later. In 1942, due to erosion from winter ice, the bridge's piers were reinforced with steel pins, new concrete, and protective steel shields. In 1958, the deck was paved and new concrete was laid over the adjacent walkways.

The 75-foot long, five-span concrete slab bridge rests on stone masonry piers and abutments. The bridge has a 28-foot, 8-inch wide reinforced concrete deck, including an 18-foot wide roadway, a 5-foot wide bridle path on the west side, and a 3-foot wide pedestrian path on the east side. The paths are separated from the roadway by concrete curbs. Originally, the deck's thickness ranged over a gentle grade from 11 inches at the roadsides to a 12.5-inch thick centerpoint. The deck's downstream edge was painted black on the recommendation of the

park's landscape architect. Thirty-inch high steel guardrails were installed along both sides of the bridge. In handwriting that appears to have been Vitale's, there are revisions to the bridge's plans recommending that the metal railing be raised 7 inches along the east side and that the curbs at both ends of the bridge be extended to "existing rocks". The recommendation for the curb extension was evidently adopted, as the curbs nearly reach the rocks on the shoreline, but the railings on the east side of the bridge are the same height as those on the west side. The handrails, thin deck, and low profile, which permit uninterrupted views of the surrounding landscape and lessen the appearance of a dam, are among the bridge's important historical features.

## Methodology and 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 methodology used for assessing impacts to this historic structure is based on how the project would 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:* Treatment is at the lowest levels of detection: barely perceptible and not measurable. For purposes of Section 106, the finding of effect would be no adverse effect.
- Minor:* Treatment would affect the character defining features of a National Register of Historic Places eligible or listed property, but is in accordance with the Secretary of the Interior's Standards. For purposes of Section 106, the finding of effect would be no adverse effect or adverse effect.
- Moderate:* Treatment would alter a character defining feature(s), diminishing the integrity of the resource to the extent that it is no longer eligible for listing in the National Register of Historic Places. For purposes of Section 106, the finding of effect would be adverse effect.
- Major:* Treatment would alter a character defining feature(s) of a National Historic Landmark, diminishing the integrity of the resource to the extent that its designation is threatened. For purposes of Section 106, the finding of effect would be adverse effect.
- Short-term:* Effects extend only through the period of construction.
- Long-term:* Effects extend beyond the period of construction.

## Impacts of Alternative A - No Action

Alternative A would result in no changes to existing facilities, including the Swiftcurrent Bridge. However, eventual deterioration of the bridge and associated features, such as stone masonry piers and abutments, would detract from the historic character of the Many Glacier Hotel Historic District. Temporary fixes that may be required to maintain access across the bridge would further detract from the historic character of the area, and the bridge would eventually need to be replaced. The neglect of a property which causes its deterioration is an adverse effect under Section 106 and its implementing regulations, 36CFR800.

### **Cumulative Impacts of Alternative A**

Rehabilitation of the Many Glacier Hotel and other past and ongoing actions (including those identified under the 2004 *Commercial Services Plan*, routine road maintenance, and new guest cabins in the vicinity of Swiftcurrent Motor Inn) as well as future actions (including implementation of the Many Glacier Wildlife Viewing Plan, anticipated rehabilitation of the Apikuni and Windy Creek Bridges and the Many Glacier Road, and possible construction of additional park employee housing in the Many Glacier area) have benefited historic structures and cultural landscapes in the Many Glacier area. Alternative A would not immediately contribute to these impacts. But the eventual deterioration of the bridge would adversely impact historic structures and cultural landscapes.

### **Conclusion**

Impacts to historic structures and cultural landscapes from the no action alternative would be moderate, adverse, site-specific to local, and long-term from the eventual deterioration of the bridge and its associated features. For Section 106 purposes, the finding of effect would be adverse. Cumulatively, impacts to historic structures and cultural resources would be both beneficial and adverse, site-specific to local, and long-term from no action combined with past, ongoing, and reasonably foreseeable actions.

## Impacts of Alternative B – Preferred Alternative

The preferred alternative would result in the demolition of the Swiftcurrent Bridge, which would remove a contributing resource to the Many Glacier Hotel Historic District. This would result in a moderate adverse impact to cultural landscapes and historic structures. The removal of the piers would permanently alter some of the historic visual characteristics of the site. The new bridge would be designed to blend with the landscape, thereby preserving some of the visual and aesthetic characteristics of the original bridge. The new bridge would also match the width of the original bridge. The demolition of an historic property is an adverse effect under Section 106 and its implementing regulations, 36 CFR800.

### **Cumulative Impacts of Alternative B**

Rehabilitation of the Many Glacier Hotel and other past and ongoing actions (including those identified under the 2004 *Commercial Services Plan*, routine road maintenance, and new guest cabins in the vicinity of Swiftcurrent Motor Inn) as well as future actions (including implementation of the Many Glacier Wildlife Viewing Plan, anticipated rehabilitation of the Apikuni and Windy Creek Bridges and the Many Glacier Road, and possible construction of additional park employee housing in the Many Glacier area) have benefited historic structures and cultural landscapes in the Many Glacier area. Alternative B would demolish a contributing resource to the Many Glacier Hotel Historic District, which would adversely impact historic structures and cultural landscapes.

## Conclusion

Demolition of the Swiftcurrent Bridge would remove a contributing resource from the Many Glacier Hotel Historic District, and would have moderate, adverse, long-term, and site-specific to local impacts to historic structures and cultural landscapes. For purposes of Section 106, the finding of effect would be adverse. Cumulatively, impacts to historic structures and cultural landscapes would be both beneficial and adverse, site-specific to local, and long-term from no action combined with past, ongoing, and reasonably foreseeable actions.

## Visitor Use and Experience

### Affected Environment

The Many Glacier Valley provides visitors with many opportunities to explore and experience Glacier National Park's outstanding natural and cultural resources, and has long been one of the park's most popular destinations. In 2013, over 270,000 people visited Many Glacier. Each year, thousands of the valley's visitors come to the Many Glacier developed area as well as nearby undeveloped areas to access hiking trails, enjoy spectacular mountain scenery, view wildlife, and use concessioner provided services including horseback riding and boat tours. Many visitors stop and/or stay at the historic Many Glacier Hotel located on the eastern shore of Swiftcurrent Lake. An iconic, internationally renowned structure set amidst some of Many Glacier's most scenic and acclaimed vistas, the National Historic Landmark hotel is the heart of the Many Glacier developed area. The Many Glacier Hotel provides visitors with overnight accommodations, quality dining, entertainment, gift shops and grocery stores, and access to Red Bus tours, among other services. For many visitors, the hotel also serves as an important source of information on trip planning, recreational opportunities, and park orientation. As the only vehicle access point, the Swiftcurrent Bridge has long been an integral part of the visitor experience for visitors to the Many Glacier Hotel and associated developed area, as well as nearby undeveloped areas.

### Methodology and Intensity Level Definitions

Potential impacts to visitor use and experience were evaluated based on staff knowledge of visitor use of the Many Glacier area. The following levels of impacts are defined:

- Negligible:* Visitors would not be affected or changes in visitor use and/or experience would be below or at the level of detection. The visitor would not likely be aware of the effects associated with the alternative.
- Minor:* Changes in visitor use and/or 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.
- Moderate:* Changes in visitor use and/or experience would be readily apparent. The visitor would be aware of the effects associated with the alternative.
- Major:* Changes in visitor use and/or experience would be readily apparent and have important consequences. The visitor would be aware of the effects associated with the alternative.
- Short-term:* Occurs only during project implementation.
- Long-term:* Occurs after project implementation is permanent.

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

If no action is taken to address the failing structural integrity of the Swiftcurrent Bridge, future bridge monitoring and inspections may determine that the structure is unsafe to handle vehicle and possibly pedestrian and equestrian traffic. As a result, access across the bridge may become limited or prohibited entirely. Visitors would no longer be able to readily access the Many Glacier developed area and the Many Glacier Hotel, thereby losing the opportunity to visit a significant and enduring cultural resource. The loss of access across the Swiftcurrent Bridge would also greatly inhibit and possibly eliminate opportunities for visitors to experience and enjoy the services and unique accommodations provided by the Many Glacier Hotel. With severely limited access to the hotel, the demand on overnight facilities elsewhere in the park could increase, resulting in less availability of overnight accommodations parkwide and possibly outside the park. The Swiftcurrent Bridge has long provided access to one of the most popular places in the park. The inaccessibility of the hotel area would be very apparent to many visitors, and could significantly affect their ability to fully experience and enjoy the Many Glacier area.

### **Cumulative Impacts of Alternative A**

A number of past and ongoing actions (including those identified under the 2004 *Commercial Services Plan*, routine road maintenance, and new guest cabins in the vicinity of Swiftcurrent Motor Inn) as well as future actions (including implementation of the Many Glacier Wildlife Viewing Plan, and anticipated rehabilitation of the Apikuni and Windy Creek Bridges and the Many Glacier Road) have been or are intended in part to benefit visitor use and experience in the Many Glacier Valley for the long-term. Implementation of Alternative A would ultimately limit or prohibit vehicle (and possibly pedestrian) access to the Many Glacier developed area and the Many Glacier Hotel. This would negate any benefits to visitors of past, ongoing, and future efforts to rehabilitate the hotel, and would undermine other actions intended to facilitate visitor use and enjoyment of the Many Glacier area.

### **Conclusion**

Alternative A would eventually prohibit vehicle access to the Many Glacier Hotel and associated developed area, and could limit pedestrian and equestrian access as well. Visitors to Many Glacier would lose opportunities to experience one of the park's most popular sites, notable for its cultural significance, scenic vistas, and numerous visitor services. The effects on visitors would be readily apparent with important and lasting consequences. Impacts to visitor use and experience under Alternative A would therefore be adverse, moderate to major, site-specific to widespread and possibly regional, and long term. Cumulatively, adverse impacts from Alternative A would undermine the beneficial effects from a number of past, ongoing, and future actions in the Many Glacier area; cumulative impacts would be adverse, minor to major, short and long-term, and site-specific to widespread and possibly regional.

## **Impacts of Alternative B – Preferred Alternative**

The preferred alternative would replace the Swiftcurrent Bridge, and thereby maintain access to the Many Glacier developed area and the Many Glacier Hotel, which is one of the park's most popular places and significant cultural resources. The benefits to visitor use and experience would be for the long term, as a new, structurally sound bridge would enable safe access for years to come.

Noise and limited access during bridge demolition and construction could have temporary, adverse impacts on visitors to the Many Glacier area. But the work would not occur until after the peak visitor season and the seasonal closure of the Many Glacier Hotel, affecting as few

visitors as possible. Work occurring within the visitor use period the following summer/fall would be minor in disturbance (low intensity deck work, paving and stone masonry), limited to daytime hours, and done while facilitating traffic through the area, though disturbance associated with these activities may detract from the immediate viewshed.

### **Cumulative Impacts of Alternative B**

The preferred alternative would further the benefit to visitors of past and ongoing actions (including those identified under the 2004 *Commercial Services Plan*, routine road maintenance, and new guest cabins in the vicinity of Swiftcurrent Motor Inn) as well as future actions (including implementation of the Many Glacier Wildlife Viewing Plan and anticipated rehabilitation of the Apikuni and Windy Creek Bridges and the Many Glacier Road) designed in part to improve the visitor experience. Temporary adverse impacts to visitors during the construction period for Alternative B would incrementally increase similar disturbances caused by other actions. But such disturbances would be short-term and outweighed by the eventual benefits of the projects.

### **Conclusion**

By replacing the Swiftcurrent Bridge, Alternative B, would beneficially impact visitor use and experience for the long term by ensuring continued access to the Many Glacier Hotel and associated developed area. The construction period for Alternative B would adversely affect visitors for the short-term due to noise, disturbance, and temporarily limited access to the hotel area. Beneficial impacts would be moderate, long-term, and site-specific to widespread and possibly regional; adverse impacts would be minor to moderate, short-term, and site-specific. Cumulatively, Alternative B would further the long-term beneficial impacts and incrementally increase the short-term adverse impacts of past, ongoing, and future actions; cumulative impacts would be beneficial and adverse, negligible to moderate, short and long-term, and site-specific to widespread and possibly regional.

## **Floodplains**

### **Affected Environment**

Floodplains are a very important component of a stream's natural processes. They slow and disperse the energy of floodwaters, providing diverse habitat for wildlife and plants that thrive on flood disturbance. Large woody debris and fine river sediment collects in floodplains, increasing biodiversity. Executive Order 11988 Floodplain Management requires all federal agencies to "avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative". The NPS is guided by the 2006 *Management Policies* and Director's Order 77-2 *Floodplain Management*, which provides guidance on how to implement Executive Order 11988. The NPS 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 Swiftcurrent Bridge, the Many Glacier Hotel, and portions of the surrounding Many Glacier developed area are located within the 100-year floodplain of Swiftcurrent Lake. The bridge is at the lake's outlet, immediately above the Swiftcurrent Falls. The falls and steep stream channel topography present some natural constriction to flood flows at the site. The bridge presents additional, minor constriction to flood flows. The U.S. Geological Survey maintains a continuous gauging station adjacent to the bridge, and flood frequency analyses have identified

100- and 500-year flood flows at 5032 and 9632 cubic feet per second, respectively (Table 5). Two significant floods occurred in 1964 and 2006, both of which resulted in overtopping of the existing bridge and some flooding of the Many Glacier Hotel. In describing the geology of the Swiftcurrent basin, Mast and Turk (1999) note: “The bedrock is very resistant to weathering and supplies little sediment to the stream.” That neither the 1964 nor the 2006 flood caused any substantial scour or undermining of the bridge’s foundations or piers is consistent with this observation.

## **Methodology & Intensity Level Definitions**

The methodology used to analyze the potential impacts on floodplains is an analysis of expected changes to floodplains under both alternatives. Changes in flood flow capacity and the lake’s accessibility to its floodplain are assessed. The following levels of impacts are defined:

- Negligible:* Floodplains would not be affected, or changes would be either non-detectable or if detected, would have effects that would be slight and non-measurable. The change would have barely perceptible consequences to riparian habitat function.
- Minor:* Changes in floodplains would be measurable, although the changes would be small and the effects would be localized. The action would affect a few individual plants or wildlife species within an existing riparian area.
- Moderate:* Changes in floodplains would be measurable, long term and on a localized scale. Plant and wildlife species within the existing riparian area would experience a measurable effect, but all species would remain indefinitely viable.
- Major:* Changes in floodplains would be readily measurable and have substantial consequences to floodplain dynamics and would be noticed on a localized scale within the watershed.
- Short-term:* After implementation, recovery would last less than one year.
- Long-term:* After implementation, recovery would last more than one year.

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

No action would occur under Alternative A, there would be no change to existing conditions, and therefore no new impacts to floodplains. The existing constriction to flood flows presented by the bridge and road would continue. Under no action, existing minor, adverse, and site-specific impacts to the floodplain would continue.

### **Cumulative Impacts of Alternative A**

Actions identified under the park’s *Commercial Services Plan* that have occurred or may occur within the Swiftcurrent Lake floodplain are limited to rehabilitation of the Many Glacier Hotel and minor improvements to dock facilities. None of these actions are anticipated to have any measurable impacts to the floodplain. Alternative A combined with these actions would continue to have incremental, non-measurable adverse effects on the floodplain.

### **Conclusion**

There would be no new impacts to the Swiftcurrent Lake floodplain. Existing constrictions to flood flows from the road and bridge would continue. These impacts would be adverse, minor, long-term, and site-specific. There would be no new cumulative impacts under this alternative.

## Impacts of Alternative B – Preferred Alternative

The proposed action would maintain an existing obstacle (i.e. a bridge) to flood flows. But replacing the existing Swiftcurrent Bridge with a longer, clear span bridge would result in slight improvements in the ability of the stream to convey flood flows, and would thereby slightly improve the floodplain condition. Model data for the bridge site comparing water surface elevation and channel velocity for the existing bridge and the proposed new bridge are presented below in Table 5. Replacing the bridge would cause little change in water surface elevations of the lake, and therefore a very small change in the elevation of the water’s edge along the lakeshore during high flow events. Removing the existing bridge’s piers from the floodplain and locating the new abutments further from the stream would decrease flood flow constriction and increase channel capacity. Alternative B would therefore offer minor improvements to the existing floodplain condition by slightly increasing the flow capacity through the bridge area. Due to maintaining the new road profile as close as possible to the existing road profile, the new bridge would continue to be over topped by flood events.

**Table 5:** HECRAS Model output for Swiftcurrent Creek Bridge, Existing and Proposed

Flow Recurrence Interval (yr)	Discharge (cfs)	Existing Bridge		Proposed Bridge		
		Water Surface Elevation (ft)	Channel Velocity at Bridge (fps)	Water Surface Elevation (ft)	Channel Velocity at Bridge (fps)	Water Surface Elevation difference* (ft)
2	1006	4885.78	8.59	4885.15	5.55	-0.63
10	1961	4887.72	8.29	4887.04	7.23	-0.68
50	3796	4890.04	9.16	4890.04	9.16	0.00
100	5032	4890.92	8.23	4890.89	8.14	-0.03
500	9632	4894.21	5.63	4894.20	5.58	-0.01

\*This is the difference between the lake’s surface elevation for the existing and proposed bridge. A negative value indicates a lake level decrease due to the proposed bridge relative to the existing bridge.

### Cumulative Impacts of Alternative B

Other actions that have occurred or may occur within the Swiftcurrent Lake floodplain are limited to rehabilitation of the Many Glacier Hotel and minor improvements to dock facilities. These actions are not anticipated to have measurable impacts to the floodplain. Alternative B combined with these actions would have negligible to minor benefits to floodplain function.

### Conclusion

Alternative B would slightly improve the existing floodplain condition by reducing flood flow constriction caused by the existing bridge’s piers and abutments. Because the flood flow constriction caused by the existing bridge is minimal to begin with, beneficial impacts to the Swiftcurrent Lake/Creek floodplain from the preferred alternative would be negligible to minor, site-specific, and long-term. A statement of findings (SOF) has been prepared and is appended to this EA.

## Water Resources

### Affected Environment

National Park Service policies require protection of water quality consistent with the Clean Water Act. The purpose of the Clean Water Act is to "restore and maintain the chemical,

physical, and biological integrity of the Nation's waters". To enact this goal, the U.S. Army Corps of Engineers has been charged with evaluating federal actions that result in potential degradation of waters of the United States and issuing permits for actions consistent with the Clean Water Act. The U.S. Environmental Protection Agency also has responsibility for oversight and review of permits and actions, which affect waters of the United States. If the preferred alternative is implemented, all necessary federal, state and local permits would be obtained to ensure compliance with the Clean Water Act.

Swiftcurrent Lake is part of the Swiftcurrent drainage in the Many Glacier Valley. Swiftcurrent Creek drains approximately 31 square miles of area upstream of Swiftcurrent Lake. The creek is a perennial, high-gradient mountain stream which eventually flows into the St. Mary River. The basin consists of rugged mountainous terrain on the eastern flank of the Continental Divide, and lies within the Saskatchewan River Basin. Average annual precipitation at Swiftcurrent Lake is about 39.6 inches per year whereas higher elevations may receive up to 6.6 feet per year. Average annual runoff for the basin is 62.4 inches. Mast and Turk (1999) describe the geology of the basin and note: "The bedrock is very resistant to weathering and supplies little sediment to the stream."

Swiftcurrent Lake has limited lakeshore development, which includes the Many Glacier developed area and Many Glacier Hotel on the eastern shore and the Swiftcurrent Bridge at the creek outlet. Motorized boat use on the lake is limited to a single concession boat tour operation, so contribution of fuel byproducts to the lake's water quality is minimal. Swiftcurrent Motor Inn and several day use and overnight camping facilities are also present along the lake and creek. These paved parking and driving surfaces concentrate precipitation and runoff and likely lead to some contribution of petroleum-based contaminants to the Swiftcurrent Lake and the creek. However, results of past monitoring programs (Ellis et al. 1992) have indicated that water quality in Swiftcurrent Lake is extremely good. The lake contains few dissolved solids, is low in nutrients and productivity, and would be sensitive to phosphorus loading.

## **Methodology & Intensity Level Definitions**

For purposes of analyzing potential impacts to water resources, the thresholds of change for the intensity of an impact are defined as follows:

- Negligible:* Neither water quality nor hydrology would be affected, or the changes would be either non-detectable or if detected, would have effects that would be considered slight and non-measurable.
- Minor:* Changes in water quality or hydrology would be measurable, although the changes would be small and the effects would be localized.
- Moderate:* Changes in water quality or hydrology would be measurable and would be noticeable on a widespread scale.
- Major:* Changes in water quality or hydrology would be readily measurable, would have substantial consequences and would be noticed on a regional scale.
- Short-term:* After implementation, recovery would take less than one year.
- Long-term:* After implementation, recovery would take more than one year or effects would be permanent.

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

As no action would be implemented, there would be no change to existing conditions and no impacts to water quality or hydrology are anticipated. Stone masonry and concrete fragments may continue to break apart from the existing bridge, but this is not anticipated to affect either water quality or hydrology.

### **Cumulative Impacts of Alternative A**

There would be no action under this alternative, and therefore no cumulative impacts to water resources.

### **Conclusion**

There would be no action under Alternative A, and no impacts to water resources.

## **Impacts of Alternative B – Preferred Alternative**

Given the lake bed at the outlet is bedrock, turbidity associated with removal of the Swiftcurrent Bridge's existing piers and abutments and placement of new abutments and riprap would be limited. Best management practices would be implemented to ensure no pollutants enter the lake as a result of the project. Vegetable oil-based lubricants would be used instead of petroleum-based products in excavators that may reach into Swiftcurrent Lake, reducing the potential for water quality impacts should any leaks/ruptures in the equipment occur. Fueling would occur more than 100 feet from any surface water in a location where a fuel spill would not be able to enter the water. A fuel/lubricant spill absorption kit would be in place to address potential land and water spills.

### **Cumulative Impacts of Alternative B**

No other projects are known to have required or are anticipated to involve in-stream work in the Swiftcurrent drainage. Should in-stream work occur for any project, best management practices would be implemented to minimize turbidity and sedimentation and to ensure no pollutants enter waterways. Therefore, no cumulative impacts to water resources would occur from Alternative B combined with past, ongoing, or reasonably foreseeable projects.

### **Conclusion**

There would be limited turbidity associated with the removal of the Swiftcurrent Bridge's existing piers and abutments and placement of new abutments and riprap. Impacts to water resources resulting from the preferred alternative would be negligible to minor, adverse, site-specific, and short-term. There would be no cumulative impacts from the preferred alternative combined with other actions since no other actions have involved or are anticipated to involve in-stream work in the Swiftcurrent drainage.

## **Wildlife**

### **Affected Environment**

The Many Glacier Valley stretches along Lake Sherburne between the park's east-side grasslands and the foot of the Continental Divide, and includes the confluence of three major drainages: Swiftcurrent, Wilbur and Cataract Creeks. The valley provides connectivity between several primary wildlife travel corridors and is made up of diverse and productive habitat types that support numerous wildlife species year-round. Avalanche chutes and shrub-fields contain essential grizzly and black bear forage in spring, summer, and fall. Highly productive riparian woodlands, sedge meadows, and wetlands provide denning, nesting, and foraging habitat for marten, mink, beaver, small mammals, bats, songbirds, raptors, and amphibians. Nesting bald

eagles forage at the valley's numerous lakes, and golden eagles and prairie falcons nest along the cliff bands. Moose, whitetail deer, and mule deer inhabit the valley year-round, and isolated, forested mountain ridges provide secure habitat for large herds of elk throughout the spring, summer, and fall. Most of the park's large carnivores including grizzly and black bears, mountain lions, Canada lynx, wolverines, and gray wolves are found in the Many Glacier Valley, partly because of the area's healthy ungulate populations.

Many Glacier's steep talus fields, high elevation ridges, and cirque basins are home to wolverines and mountain goats, and the drainage contains critical winter and spring range as well as important lambing and rutting grounds for Rocky Mountain bighorn sheep. Several bighorn sheep migration corridors that have probably been in continual use for over 4,000 years traverse the drainage and provide connectivity among seasonally important habitats. One of these routes crosses directly behind (east of) the Many Glacier Hotel, in the vicinity of the Swiftcurrent Bridge project area, and is used regularly by bighorn sheep in the fall and spring to access seasonal ranges and lambing/rutting areas (Keating 2005).

The Many Glacier Valley floor is narrow and contains several large lakes. The Sherburne Dam, constructed in 1919, flooded several small lakes, reaches of Swiftcurrent Creek, and highly productive riparian/wetland areas. Today, the immediate shoreline surrounding Lake Sherburne supports little vegetation because of fluctuating water levels and is marginally important wildlife habitat. But lakeside meadows, including Apikuni Flats, provide late fall, winter, and spring habitat for elk and there is a bald eagle nesting territory with two known nest sites on the slopes above Lake Sherburne. North-south movement of many wildlife species occurs within the limited forested habitat between the valley's lakes.

The Many Glacier Road bisects year-round wildlife habitat and primary wildlife travel corridors. Many wildlife species utilize valuable habitat within the road corridor, and wild animals cross the road regularly. During the late fall, winter, and early spring, the remoteness of the Many Glacier Valley and relative lack of human activity encourage the valley's more elusive species, such as lynx, marten, and wolverine, to use available habitats found adjacent to or within developed areas, including the vicinity of the Many Glacier Hotel and Swiftcurrent Bridge. During the high visitor use period (generally between late May and early September), these species may tend to avoid developed areas. Park managers discourage some wildlife species, including black bears, grizzly bears, and mountain lions from frequenting developed areas.

## Methodology & Intensity Level Definitions

The methodology used to analyze the potential impacts on wildlife is an analysis of expected changes to wildlife behavior and habitat under the action and no action alternatives. Glacier National Park wildlife databases and current research and monitoring data were used to determine wildlife use of the project area. Disturbance to wildlife and changes in behavior, movement patterns, and habitat are assessed. The following levels of impacts are defined:

- Negligible:* Effects would be at or below the level of detection and the changes would be so slight that they would not be of any measurable or perceptible consequence to wildlife species' populations.
- Minor:* Effects on wildlife species would be detectable, although the effects would be localized and would be small and of little consequence to the species' population.
- Moderate:* Effects on wildlife species would be readily detectable and widespread, with

consequences at the population level.

*Major:* Effects on wildlife would be obvious and would have substantial consequences to species' populations in the region.

*Short-term:* After implementation, would recover in less than 1 year.

*Long-term:* After implementation, would take more than 1 year to recover or effects would be permanent.

## Impacts of Alternative A – No Action

There would be no action under this alternative and therefore no new disturbances or impacts to wildlife or wildlife habitat.

### **Cumulative Impacts of Alternative A**

Since no new impacts would occur under no action, there would be no cumulative impacts.

### **Conclusion**

No action would occur under Alternative A, and there would be no new disturbances or impacts to wildlife.

## Impacts of Alternative B – Preferred Alternative

Under Alternative B, wildlife would be exposed to an increase in human activity during a time when visitor use of the Many Glacier Valley is typically low. Species that rely on low-visitor use periods to travel and/or forage in the vicinity of the Swiftcurrent Lake outlet could be displaced by project noise and the presence of project personnel and equipment. Nighttime construction activity (as part of the anticipated 24 hours per day, seven days per week work schedule) could adversely affect animals within and adjacent to the project area that are more active at night. Glare and light scatter from the work lights could extend disturbances to areas beyond the work site. Animals travelling the road corridor could be displaced by construction vehicles, and the risk of vehicle/wildlife collisions could increase, especially at night. Additionally, the presence of project personnel during a low visitor use period could increase the potential for wildlife in the area to become increasingly habituated to human activity. Bighorn sheep and other ungulates could be attracted to minerals exposed by excavation at the bridge site or to engine fluids that leak from construction equipment. Strict measures would be enforced to secure food and garbage attractants and prevent any occurrence of wildlife food conditioning. Work is anticipated to be underway 24 hours a day/seven days a week, which would deter bighorn sheep and other wildlife from attempting to cross a previously available crossing while the bridge is not in place.

Adverse impacts to wildlife from the project would be short-term, occurring over a single, approximately three month-long period in the fall. Relatively undisturbed habitat conditions would be restored for the winter months, as work would not be underway during winter. Remaining work in the spring is not anticipated; should springtime work become necessary, it would not begin until after the core wildlife security period (January 1 to March 31), and additional mitigation measures (such as limitations on night work, for e.g.) may be implemented as necessary and feasible for timely project completion. Final deck work, stone masonry, and paving during summer/fall would be of low intensity, would occur during daytime hours only, and would therefore be less potentially impactful than bridge demolition and construction. Once Alternative B is completed, the risk of disturbance to wildlife and displacement of long-

term animal movement patterns that have persisted across the landscape for decades would return to existing levels.

### **Cumulative Impacts of Alternative B**

Displacement of wildlife, habitat disturbances, and wildlife habituation to human activity from past and ongoing actions (including those identified under the 2004 *Commercial Services Plan*, routine road maintenance, and new guest cabins in the vicinity of Swiftcurrent Motor Inn) as well as future actions (including implementation of the Many Glacier Wildlife Viewing Plan, anticipated rehabilitation of the Apikuni and Windy Creek Bridges and the Many Glacier Road, and possible construction of additional park employee housing in the Many Glacier area) would increase for the short-term under the preferred alternative.

### **Conclusion**

The preferred alternative could negatively affect wildlife that rely on low levels of human activity during the fall to travel and forage in the vicinity of the Swiftcurrent Lake outlet. Species that are active at night could be adversely affected by noise and lighting from nighttime construction activity, animals crossing the Many Glacier Road could be at higher risk of vehicle collisions, and the presence of project personnel during the construction period could increase the potential for wildlife to become habituated to human activity. Adverse impacts to wildlife would be site-specific to local, short-term, and negligible to minor. Cumulatively, there would be short and long-term, site-specific to local, negligible to moderate adverse impacts to wildlife from human activity associated with the preferred alternative and past, ongoing, and future actions.

## **Threatened and Endangered Species Affected Environment**

**Grizzly bear (*Ursus arctos horribilis*)**, federally listed threatened species. Glacier National Park is part of the Northern Continental Divide Ecosystem (NCDE) Grizzly Bear Recovery Zone. The northern third of the NCDE is occupied by the Greater Glacier Area (GGA), which includes the park and is defined from north to south by the Canadian border and the park's southern boundary, and from east to west by the Blackfoot Indian Reservation and the Whitefish Mountains (Kendal et al. 2008). Genetic analysis of hair samples collected during 1998-2000 resulted in a population estimate of 241 grizzly bears in the GGA (Kendall et al. 2008). No population estimate has been developed exclusively for Glacier National Park. Data from the NCDE grizzly bear population trend monitoring project indicates that the ecosystem's grizzly bear population trend is increasing at 3% per year, 2004-2009 (Mace et al. 2012).

The Many Glacier Valley is a seasonal bear concentration area. Grizzly bear sightings are most frequently reported from May through August. The number of reported observations is likely correlated with visitor use, and is not necessarily an indicator of relative grizzly bear presence and habitat use. Some bears have habituated to the high level of human activity during the summer, and continue to use open habitats along roads and within sight of facilities and areas where people are present. Bears that are more sensitive to human disturbance may avoid developed areas entirely or concentrate their activity at night or in remote areas relatively free from human influence.

Grizzly bear habitat is found throughout the park from the lowest valley bottoms to the summits of the highest peaks. Grizzly bears require large areas of undeveloped habitat, including a mixture of forests, moist meadows, grasslands, and riparian habitats, and a substantial amount of solitude from human interactions (USFWS 1993). They have home ranges of 130 to 1,300

square kilometers (USFWS 1993). Grizzly bear seasonal movements and habitat use are tied to the availability of different food sources. In spring, grizzly bears feed on winter-killed ungulates and early greening herbaceous vegetation at lower elevations (Martinka 1972). During the summer, some bears move to higher elevations in search of glacier lilies and other roots, berries, and army cutworm moths. In the fall, bears will continue to forage for berries, roots, insects, and carrion and will broaden their search for food considerably in order to build up enough fat reserves for the winter denning period.

Glacier National Park was placed into grizzly bear management “situations” in accordance with the Grizzly Bear Recovery Plan (USFWS 1993) and Interagency Grizzly Bear Committee (IGBC) guidelines. Over 1 million acres of the park (proposed wilderness) are established as Management Situation 1, in which management decisions favor the needs of the grizzly bear when grizzly habitat and other land-use values compete, and grizzly-human conflicts are resolved in favor of grizzlies, unless a bear is determined to be a nuisance. The remainder of the park is developed front-country and established as Management Situation 3, where grizzly habitat maintenance and improvement are not the highest management considerations, grizzly bear presence is actively discouraged, and any grizzly involved in a grizzly-human conflict is controlled.

Grizzly bears make extensive use of the Many Glacier and Swiftcurrent Valleys throughout the year. From August through October, grizzly and black bears typically forage on the valleys’ southerly slopes, feeding on serviceberry and kinnikinnik berries and other plants. Important grizzly bear travel corridors exist near the Swiftcurrent Motor Inn and the Many Glacier Hotel. Grizzly bears den annually in the Many Glacier geographic area. Grizzly bears inhabiting the park’s east side typically enter their dens in late November and emerge in late March or early April (GNP files). The project location is within Management Situation 3. In accordance with the management protocol for areas in Management Situation 3, the park actively discourages grizzly bears from frequenting the Many Glacier developed area.

Canada lynx (*Lynx canadensis*), federally listed threatened species. Historically, Canada lynx were considered “more or less common” throughout the park (Bailey and Bailey 1918). Sightings declined during the 1970s and 1980s and have increased in recent years (NPS files). Sightings may not be particularly sensitive to population changes, however, and should be interpreted with caution. Systematic lynx surveys via snow tracking in 1994 and hair-snare/DNA sampling in 1999 and 2000 detected lynx in several drainages throughout the park, including the Many Glacier Valley; no population estimates or trends were attempted during these studies.

Across their range, lynx typically inhabit gentle, rolling topography (Maletzke et al. 2008, Squires et al. 2013) with dense horizontal cover, persistent snow, and moderate to high snowshoe hare densities. In the western United States, lynx are most closely associated with Engelmann spruce, subalpine fir and lodgepole pine forest types between elevations of 4,920 to 6,560 feet (McKelvey et al. 2000). Dry forest cover types (e.g., ponderosa pine, dry Douglas-fir) do not provide lynx habitat (Koehler et al. 2008, Maletzke et al. 2008, Squires et al. 2010). Snowshoe hare are the primary prey of lynx.

In Many Glacier, habitat modeling indicates the presence of non-contiguous, high value lynx habitat at higher elevations north of Lake Sherburne and contiguous high value habitat south of the lake on adjacent north aspect slopes. The valley contains aspen forests as scattered inclusions within subalpine and montane forests. Berg et al. (2012) found that some of the highest snowshoe hare densities in Wyoming occur in multi-story mixed aspen/spruce-fir forests. Aspen/tall forb community types may be productive habitat for snowshoe hares, grouse,

and other potential lynx prey. The presence of aspen may account for the frequent occurrence of lynx in the Many Glacier Valley. With the exception of some higher quality habitat in the Swiftcurrent area, the model suggests that lynx habitat values at the Swiftcurrent Bridge site and along the Many Glacier Road corridor are predominantly low.

No lynx den sites have been found in the Many Glacier valley, but lynx and lynx sign have been recorded in the area for over 40 years. Park records contain many records of lynx from Many Glacier, including several observations of family groups. Lynx were captured and released from wolverine live-traps approximately 35 times during a wolverine population study in the Many Glacier Valley in the winters of 2004-2007. These captures represent an unknown number of individual lynx. Over the last ten years, lynx and lynx tracks have been observed in the Many Glacier Valley during winter and early spring (December – April) (GNP files).

Few studies have examined how lynx react to human presence. Some anecdotal information suggests that lynx are quite tolerant of humans, although given differences in individuals and contexts, a variety of behavioral responses to human presence may be expected (Staples 1995, Mowat et al. 2000). Preliminary information from winter recreation studies in Colorado indicates that some recreation uses are compatible, but lynx may avoid some developed ski areas (J. Squires, personal communication 2012). Some wildlife species have been found to be more sensitive to disturbance when bearing and rearing young than in other times of the year. Olson et al. (2011) noted that lynx dens were located in more remote areas and unlikely to be disturbed by humans. Highways pose a risk of direct mortality to lynx and may inhibit lynx movement between previously connected habitats. Lynx and other carnivores may avoid using habitat adjacent to highways, or become intimidated by highway traffic when attempting to cross (Gibeau and Heuer 1996, Forman and Alexander 1998). Alexander et al. (2005) suggested traffic volumes between 3,000 and 5,000 vehicles per day may be the threshold above which successful crossings by carnivores are impeded.

**Wolverine (*Gulo gulo*), proposed threatened species.** A rarely seen resident of coniferous forests and alpine meadows, the wolverine inhabits the park on both sides of the Continental Divide. Wolverines utilize a range of habitats including alpine areas, mature forests, ecotonal zones, and riparian habitats, and use large areas for dispersal. Male wolverines can cover over 150 kilometers per week with short movements between denning and foraging areas intermixed with longer movements of ten kilometers or more (Copeland and Yates 2008).

Glacier National Park has very high quality wolverine habitat due to extensive alpine areas, rugged topography, remoteness, and diverse ungulate populations. A wolverine study conducted from 2002-2005 estimated the park's wolverine population at between 40-45 animals (Copeland and Yates 2008). Average home ranges for wolverines in Glacier National Park are 521 square kilometers for males and 139 square kilometers for females (Copeland and Yates 2008). Wolverines move to lower elevations during the winter where they search for carrion in ungulate winter ranges. Den sites are typically located under deep snow, usually on high elevation talus slopes in sparsely forested areas with boulders, rock caves, and downed woody debris (Copeland and Yates 2008).

Numerous wolverine sightings and track observations have been reported in the Many Glacier Valley (GNP files), and wolverines have been documented using the area as part of their home range and during travel forays (Copeland and Yates 2008). Wolverines are routinely documented using the Many Glacier geographic area, and have been observed in the Many Glacier developed area. Several of these observations have occurred in winter or early spring when human use is at its lowest. Because they range widely, wolverines may travel through

developed areas on a temporary and sporadic basis. A number of the park's wolverine sightings have involved observations of the animal on or along roadsides or feeding on roadkill. A wolverine was killed in the fall of 2007 by a road construction vehicle on the Going-to-the-Sun Road (GNP files).

On February 4, 2013, the USFWS published a proposal in the Federal Register to list the wolverine as a threatened species (Federal Register 2013). The USFWS has determined that habitat loss from decreased snow pack in the late spring as a result of higher temperatures and climate change is likely to significantly, adversely affect wolverine populations within the contiguous United States. Continued habitat loss could threaten wolverines in the contiguous United States with extinction (Federal Register 2013).

## Methodology & Intensity Level Definitions

The methodology used to analyze the potential impacts on threatened, endangered and species of concern is an analysis of expected changes to these species under the action and no action alternatives. Glacier National Park databases and current research and monitoring data were used to determine species use of the project area. Disturbance and changes in behavior and movement patterns are assessed. The following levels of impacts are defined:

- Negligible:* The alternative would affect an individual of a listed species or its critical habitat, but the change would be so small that it would not be of any measurable or perceptible consequence to the protected individual or its population.
- Minor:* An individual(s) of a listed species or its critical habitat would be affected, but the change would be small.
- Moderate:* An individual or population of a listed species, or its critical habitat would be noticeably affected. The effect could have some long-term consequence to individuals, populations, or habitat.
- Major:* An individual or population of a listed species, or its critical habitat, would be noticeably affected and there could be a vital consequence to the population or habitat.
- Short-term:* After implementation, would recover in less than 1 year.
- Long-term:* After implementation, would take more than 1 year to recover or effects would be permanent.

The impact intensity levels for federally listed species are classified using the following terminology, as defined under Section 7 of the Endangered Species Act:

- No Effect:* There would be no effects, either positive or negative, to a listed species or its critical habitat. No incidental take of a listed species would be anticipated. Consultation with the USFWS is not required.
- May Affect / Not Likely to Adversely Affect:* Effects on listed species or its critical habitat would be insignificant or discountable (i.e. cannot be meaningfully measured, detected, or evaluated, or are extremely unlikely to occur). No incidental take of a listed species would be anticipated. Requires informal consultation with the USFWS and written concurrence.

*Beneficial:* All effects to a listed species or its critical habitat are entirely beneficial or positive without any adverse effects to the species or habitat. No incidental take of a listed species would be anticipated. Requires informal consultation with the USFWS and written concurrence.

*May Affect, Likely to Adversely Affect:* At least one adverse effect may occur to a listed species or its critical habitat and the effect is not insignificant, discountable, or beneficial. Incidental take may or may not be anticipated. Requires formal consultation with the USFWS.

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

No action would occur under this alternative, and existing levels of disturbance to grizzly bears, Canada lynx, and wolverines within the Many Glacier Valley would not change as a result.

### **Cumulative Impacts of Alternative A**

No action would be taken under this alternative, and there would be no change to existing conditions or current levels of disturbance for grizzly bears, Canada lynx, and wolverines. There would therefore be no cumulative impacts under this alternative.

### **Conclusion**

No action would be taken under Alternative A, and there would be no new impacts or changes in current levels of disturbance to grizzly bears, Canada lynx, and wolverines.

## **Impacts of Alternative B – Preferred Alternative**

### **Grizzly Bear**

Alternative B could displace grizzly bears that rely on nighttime and/or the low-visitor use period in the fall to forage and travel near the foot of Swiftcurrent Lake. Final bridge work the following summer/fall in 2015 would be less intensive, involving deck work, stone masonry, and paving, and would therefore be less potentially disruptive to bears. Work in the spring is not anticipated; should springtime work be necessary, it would not begin until after the core wildlife security period (January 1 to March 31), and additional mitigation measures (such as limitations on night work, for e.g.) may be implemented as necessary and feasible for timely project completion. The presence of project personnel at the bridge site and equipment staging areas, and construction vehicles travelling the Many Glacier Road would increase the potential for grizzly bears to become habituated. Strict enforcement of food and garbage storage requirements and onsite monitoring by park staff would prevent bears from obtaining human food.

Construction activities would be short-term and localized to the project area, but there would be intermittent vehicle activity along the Many Glacier Road due to construction traffic. Both the Swiftcurrent Bridge and the Many Glacier Road are in developed areas designated as Management Situation 3. Therefore, there would be no loss of grizzly bear habitat. Impacts to bears would be short-term, for the duration of the project only. During construction, grizzly bears would be discouraged from frequenting the project area, in keeping with Management Situation 3 management protocols.

The mortality risk to grizzly bears under Alternative B would be negligible or less. Heavy hauling trucks travelling the Many Glacier Road at night could present some mortality risk to bears. Nighttime hauling is not anticipated, however, and would be expected to be infrequent if it does occur. The risk to bears would be mitigated by requiring hauling vehicles greater than 20,000

gvw travelling the Many Glacier Road within the park boundary at night to observe speeds 10 mph below the posted speed limit, and by the presence of park wildlife monitors and/or law enforcement rangers who would monitor hauling and escort nighttime hauling trucks from the park entrance to the project area whenever possible (see Mitigation Measures).

Under Section 7, adverse effects to grizzly bears from possible displacement would be difficult to detect or measure and there would be no effects to grizzly bear habitat under Alternative B. Mitigation measures preventing bears from obtaining food rewards and minimizing the chances of bear human conflict would further reduce the risk of adverse effects and make the prospect of incidental take as defined by the USFWS extremely unlikely. The Section 7 determination for effects to grizzly bears would therefore be “may affect, not likely to adversely affect”.

### **Canada Lynx**

Under Alternative B, Canada lynx would be exposed to an increase in human activity during the construction period, at a time when visitor activity in the area is typically low. Given the relatively low lynx habitat values near the foot of Swiftcurrent Lake, it is unlikely that lynx would be foraging within or very near the project area. Individual lynx travelling through or near the area could be displaced during both the day and nighttime by project noise and the presence of project personnel and equipment. Lynx travelling the road corridor could be displaced by construction vehicles, and the risk of a lynx being injured or killed due to collisions with vehicles could increase, especially at night. Nighttime hauling is not anticipated, however, and would be expected to be infrequent if it does occur. The risk of mortality to lynx would be mitigated by requiring hauling vehicles greater than 20,000 gvw travelling the Many Glacier Road within the park boundary at night to observe speeds 10 mph below the posted speed limit, and by the presence of park wildlife monitors and/or law enforcement rangers who would monitor hauling and escort nighttime hauling trucks from the park entrance to the project area whenever possible (see Mitigation Measures). Final deck work, stone masonry, and paving the following summer/fall would be of low intensity, would not involve night work and would be unlikely to adversely affect lynx. Work in the spring is not anticipated; if springtime work is necessary, it would not begin until after the core wildlife security period (January 1 to March 31), and additional mitigation measures (such as limitations on night work, for e.g.) may be implemented as necessary and feasible for timely project completion.

Alternative B would not result in the modification of lynx habitat, the reduction of lynx prey species, or the expansion of the range of species that typically compete with or prey upon lynx. The proposed construction activities also would not alter existing human use patterns in or near areas that could potentially serve as den sites. The proposed activity would be short-term and limited to the project area, as well as the Many Glacier Road corridor due to construction vehicle traffic.

Under Section 7, adverse effects to lynx from possible displacement would be difficult to detect or measure and there would be no effects to lynx habitat under Alternative B. The prospect of incidental take as defined by the USFWS would be extremely unlikely. The Section 7 determination for effects to lynx would therefore be “may affect, not likely to adversely affect”.

### **Wolverine**

Under Alternative B, an increase in human activity and noise during the construction period at a time when visitor use in Many Glacier is typically low could displace individual wolverines travelling within or near the foot of Swiftcurrent Lake. Effects would be temporary and generally localized to the vicinity of the project area, as well as the Many Glacier Road due to construction related traffic. Heavy trucks travelling the Many Glacier Road at night could

present a risk of injury or mortality to individual wolverines. Nighttime hauling is not anticipated, however, and would be expected to be infrequent if it does occur. Risks to wolverines from truck traffic could be mitigated by limiting nighttime vehicles greater than 20,000 gw travelling the Many Glacier Road within the park boundary to speeds 10 mph below the posted speed limit. Additionally, onsite wildlife monitors and/or park law enforcement rangers would monitor hauling and escort nighttime hauling trucks from the park entrance to the project area whenever possible. Final deck work, stone masonry, and paving the following summer/fall would be of low intensity, would not involve night work, and would be unlikely to impact wolverines. Work in the spring is not anticipated; if spring work does occur, it would not begin until after the core wildlife security period (January 1 to March 31), and additional mitigation measures (such as limitations on night work, for e.g.) may be implemented as necessary and feasible for timely project completion.

Under Section 7, the park has determined that the bridge replacement would “not likely jeopardize” wolverines in Glacier National Park. At this time, the USFWS is not requiring an effects determination for wolverines at a level beyond “not likely to jeopardize”, and further consultation with the USFWS is not required.

### **Cumulative Impacts of Alternative B**

In combination with past and ongoing actions (including those identified under the 2004 *Commercial Services Plan*, routine road maintenance, and new guest cabins in the vicinity of Swiftcurrent Motor Inn) as well as future actions (including implementation of the Many Glacier Wildlife Viewing Plan, anticipated rehabilitation of the Apikuni and Windy Creek Bridges and the Many Glacier Road, and possible construction of additional park employee housing in the Many Glacier area), the preferred alternative could incrementally and temporarily increase the potential for grizzly bears, lynx, and wolverines to be displaced or disturbed.

### **Conclusion**

The preferred alternative could negatively affect grizzly bears, lynx, and wolverines that rely on low levels of human activity during the fall to travel and/or forage near the foot of Swiftcurrent Lake and within the Many Glacier Road corridor. The presence of project personnel during the construction period would increase the potential for grizzly bears to become habituated to people. Grizzly bears, lynx, or wolverines crossing the Many Glacier Road would be at some risk of injury or mortality from vehicle collisions, but this risk would be minimized by mitigation measures that would be in place (see Mitigation Measures). Adverse impacts to grizzly bears, lynx, and wolverine would be site-specific to local, short-term, and minor to moderate. Impacts from completion work the following summer/fall would be minor due to the reduced intensity of the work and the absence of nighttime construction. Cumulatively, there would be short and long-term, site-specific to local, negligible to moderate adverse impacts to grizzly bears, lynx, and wolverines from human activity associated with the preferred alternative and past, ongoing, and future actions.

The Section 7 determination for effects to grizzly bears and lynx would be “may affect, not likely to adversely affect”, and “not likely to jeopardize” for wolverine.

## **Natural Soundscapes Affected Environment**

An important part of the NPS mission is to preserve the natural soundscapes of national parks. The natural ambient soundscape is the aggregate of all the natural sounds that exist in the

absence of human-caused sound. Natural sounds occur within and beyond the range of sounds that humans can perceive and can be transmitted through air, water, or solid materials. Natural soundscapes have intrinsic value as part of the unique environment of Glacier National Park, and predominate throughout most of the park. Natural soundscapes vary across the park, depending on elevation, proximity to water, vegetative cover, topography, time of year, and other influences.

Noise intrusions to natural soundscapes can mask biologically important sounds, degrade habitat, and cause behavioral and physiological changes in wildlife, and can interfere with visitors' experience of quietude or other qualities of the natural soundscape. The effects of noise typically diminish as the distance from the source of the noise increases. However, depending on sound frequencies and environmental factors, noise intrusions can contribute to overall background noise over very large distances, even if they are not distinctly audible.

In general, soundscapes in the park are managed according to the management objectives for the park's four different management zones (backcountry, rustic, day use, and visitor service). Existing ambient sound levels differ within each of these zones, and therefore soundscape management objectives for each zone are also different. The Many Glacier developed area and the Swiftcurrent Bridge are within visitor service and day use zones (NPS 1999). According to the park's *General Management Plan* (NPS 1999), visitor service and day use zones allow for heavier use and more congested conditions. Some level of human caused, artificial noise is therefore expected. Soundscapes in day use zones are managed for a range of conditions that include some noise as well as natural sounds and quiet, depending on their location in the park, while visitor service zones are managed for higher levels of human caused noise.

The soundscape in the vicinity of the Swiftcurrent Bridge is dominated by the sound of rushing water due to the waterfall immediately downstream of the bridge. Other natural sounds, such as those generated by wind and wave action on the lakeshore, and human caused sounds including road traffic on the Many Glacier Road, engine noise from the concessioner-operated tour boat on Swiftcurrent Lake, and sounds produced by human activity at the Many Glacier Hotel characterize the soundscape in the area. Natural ambient sound levels (natural sounds only) in the area range from 25 to 35 dBA, and existing ambient sound levels (natural and human-caused sounds) range from 30 to 35 dBA (U.S. DOT 2009).

## Methodology and Intensity Level Definitions

The methodology used to assess potential impacts to the natural soundscape is an analysis of expected changes to existing sound levels under the different alternatives. Impacts to soundscapes are often gauged by how they could affect visitor experience and wildlife behavior, physiology and habitat, and such effects are considered in the analysis. The analysis examines the level and duration of noise generated by the project, as well as environmental factors that may attenuate or dampen artificial noise. The following levels of impacts are defined:

- Negligible:* Noise from the action would be below the level of detection and would not result in any perceptible consequences.
- Minor:* Noise from the action would be localized and rarely audible, and/or would occur for less than 1 month.
- Moderate:* Noise from the action would be localized to widespread and periodically audible, and/or would occur for 1 to 3 months.

**Major:** Noise from the action would be widespread, regularly audible, and/or would occur for more than 3 months.

**Short-term:** Would occur only during project implementation.

**Long-term:** Would be permanent or occur beyond project implementation.

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

There would be no action under this alternative, and therefore no change to existing conditions and no new impacts to natural soundscapes.

### **Cumulative Impacts of Alternative A**

Alternative A would not contribute to impacts from past, ongoing, and future actions as no new activities that affect natural soundscapes would occur.

### **Conclusion**

No action would be taken under Alternative A, and there would be no impacts to natural soundscapes.

## **Impacts of Alternative B – Preferred Alternative**

During implementation of Alternative B, the level and occurrence of human-caused noise would increase due to construction activities, including operation of heavy equipment, additional vehicle traffic, and the presence of construction crews. In general, most of the noise generated by the project would be expected to range up to approximately 90 dBA 50 feet from the source. Higher noise levels would be expected during demolition of the bridge (approximately 90 dBA or less) than during bridge construction (approximately 81 dBA or less). Noise levels could spike to about 110 dBA 50 feet from the source during pile driving for the new abutments, but pile driving would occur temporarily and intermittently, and would not be anticipated to take longer than approximately one week (estimated).

Noise produced during the replacement of the bridge would likely attenuate (reduce in amplitude) due to vegetation and topography, and would also likely be considerably dampened by natural sounds generated by wind and the waterfall immediately downstream of the bridge. Noise reduction from vegetation and topography are difficult to quantify.

While the project would generate frequent noise over the duration of the construction period, the noise would not be continuous. Noise would be interrupted periodically and episodes of noise would last only as long as the activity that is generating the sound. Noise would be short-term, ceasing altogether once the project is completed, and would not occur for more than three months at a given time.

Few visitors would be impacted by noise from the proposed actions since the work would occur after the Many Glacier Hotel and other concessions operations in the valley are closed for the season. Noise disturbances could adversely affect wildlife, possibly causing some individual animals to temporarily avoid the project area. But sensitive breeding, nesting, denning, and rearing periods for resident wildlife species would be over by the time the project is underway. Noise generated by project activity the following summer/fall would also occur after critical nesting and denning periods, and would have negligible effects to wildlife due to the low intensity of the anticipated work. Paving would occur at this time, but would be of such short duration as to produce only negligible to minor impacts to soundscapes.

### **Cumulative Impacts of Alternative B**

Disturbances to natural soundscapes in the vicinity of the Swiftcurrent Bridge from past and ongoing actions (including those identified under the 2004 *Commercial Services Plan*, routine road maintenance, and new guest cabins in the vicinity of Swiftcurrent Motor Inn) as well as future actions (including implementation of the Many Glacier Wildlife Viewing Plan, anticipated rehabilitation of the Apikuni and Windy Creek Bridges and the Many Glacier Road, and possible construction of additional park employee housing in the Many Glacier area) would increase for the short-term under the preferred alternative.

### **Conclusion**

Noise from construction activity under Alternative B would temporarily increase the level and occurrence of human-caused noise in the project area. The noise would not be continuous, would be dampened by environmental conditions, vegetation, and topography, and would not occur during sensitive wildlife nesting or denning periods. The project would also not take place during the peak visitation season. Measurable project noise would not occur for more than three months at a given time, and would cease altogether once the project is complete. The preferred alternative would therefore have moderate adverse, site-specific to local, and short-term impacts to natural soundscapes within the Many Glacier developed area. Cumulatively, impacts from Alternative B combined with other past, ongoing, and reasonably foreseeable actions would be negligible to moderate, adverse, site-specific to local, and short and long-term.

## **Compliance Requirements**

**National Environmental Policy Act (NEPA) and Regulations of the Council on Environmental Quality** – The National Environmental Policy Act applies to major federal actions that may significantly affect the quality of the human environment. This generally includes major construction activities that involve the use of federal lands or facilities, federal funding, or federal authorizations. This EA meets the requirements of the NEPA and the Council on Environmental Quality in evaluating potential effects associated with activities on federal lands. If no significant effects are identified, a finding of no significant impacts (FONSI) would be prepared. If significant effects are identified, a notice of intent (NOI) would be filed for preparation of an environmental impact statement (EIS).

**Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.)** – Section 7 of the Endangered Species Act is designed to ensure that any action authorized, funded, or carried out by a federal agency likely would not jeopardize the continued existence of any endangered or threatened plant or animal species. If a federal action may affect threatened or endangered species, then consultation with the U.S. Fish and Wildlife Service is required. The NPS has determined that the proposed action “**may affect, but is not likely to adversely affect**” **grizzly bears and Canada lynx** and “**is not likely to jeopardize**” **wolverines**; the NPS has determined that there would be “**no effect**” to **bull trout, water howellia, and Spalding’s catchfly**. In accordance with Section 7, the NPS has initiated informal consultation with the USFWS. A biological assessment (BA) was submitted to the USFWS on December 13, 2013. The USFWS concurred with the NPS determinations on January 7, 2014.

**Clean Water Act (CWA) and State and Local Water Quality and Floodplain Regulations** – If the preferred alternative is implemented, all necessary federal, state and local permits would be obtained to ensure compliance with the Clean Water Act.

**Executive Order 11990, Protection of Wetlands** – E.O. 1190 was issued in 1977 “. . .to avoid to the extent possible the long and short term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative. . .”. There are no wetlands in the project area. Wetlands would therefore not be affected.

**Executive Order 11988, Floodplain Management** – E.O. 11988 requires all federal agencies to “avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative”. According with Director’s Order 77-2, the impacts of proposed actions within the 100-year floodplain must be addressed in a separate Statement of Findings (SOF). The project would reduce existing flood flow constrictions and improve conveyance conditions for water, debris, and ice within the channel. This would result in negligible to minor improvements to the existing site-specific floodplain conditions. A statement of findings for floodplains has been prepared and is attached.

**National Historic Preservation Act of 1966, as amended (16 U.S.C. 470, et seq.)** – Section 106 of the National Historic Preservation Act of 1966 (as amended) requires all federal agencies to consider effects from any federal action on cultural resources eligible for or listed in the National Register of Historic Places (NHRP) prior to initiating such actions. The proposed project would result in the demolition of the Swiftcurrent Bridge, a contributing feature to the

Many Glacier Hotel Historic District. During scoping, Glacier National Park notified the Montana State Historic Preservation Office (SHPO), the Confederated Salish and Kootenai Tribes, and the Blackfoot Tribal Business Council of the project in accordance with 36 CFR800. The park also notified the Advisory Council on Historic Preservation of the adverse effect finding; the Council did not provide notice that it would participate in the consultation process. The Area of Potential Effect has been surveyed for archeological resources and none were identified. Neither the Blackfoot Tribal Business Council nor the Confederated Salish and Kootenai Tribes raised concerns about the proposed action. The NPS has documented a finding of “adverse effect” in a letter to the Montana SHPO dated January 6, 2014. SHPO concurrence was received on January 24, 2014.

## **Consultation and Coordination**

### **Internal and External 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. Internal scoping was conducted by an interdisciplinary team of professionals from the park. Interdisciplinary team members met on numerous occasions to discuss the 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. Over the course of the project, team members have conducted individual site visits to view and evaluate the proposed construction site.

External scoping was initiated with the distribution of a scoping letter to inform the public of the proposal to replace the Swiftcurrent Bridge and the intent to prepare an environmental assessment. Scoping began on November 7, 2012, and the comment period closed on January 3, 2013. A press release was distributed to several media outlets and a scoping brochure was mailed to individuals and organizations on the park's EA mailing list, including members of Congress and various federal, state, and local agencies. An email announcement was sent to a number of interested parties with a link to the brochure on the NPS Planning, Environment, and Public Comment (PEPC) website, where scoping information was also posted.

During the scoping period, four letters were received; from a park concessioner, the National Parks Conservation Association, the US Army Corps of Engineers (COE), and Montana Department of Environmental Quality (DEQ). The COE and Montana DEQ letters outlined regulatory requirements for the proposed project. The other two letters were supportive of the proposal to replace the Swiftcurrent Bridge, and expressed concern that the replacement be timed to minimize impacts to park visitors. The commenters also suggested matching the design of the new bridge to the existing, minimizing impacts to water quality, and ensuring the bridge is safe for crossing by horses.

### **Agency Consultation**

In accordance with the Endangered Species Act, Glacier National Park initiated informal consultation with the USFWS on November 7, 2012. On December 13, 2013 the park submitted a biological assessment to the USFWS addressing the effects to federally listed species. The USFWS concurred with the effect determinations in a letter dated January 7, 2014. The park informed the USFWS during a phone call on January 6, 2014 that, while not anticipated, the preferred alternative may include possible follow-up work in the spring of 2015 if necessary (if bridge construction is delayed by winter weather conditions, for example). Any necessary spring work would not occur until after the January 1-March 31 core wildlife security period for the Many Glacier Road. Springtime work was not included in the biological assessment submitted to the USFWS on December 13, 2013. Therefore, per the January 6, 2014 discussion with the USFWS and should work in the spring be necessary, the park would submit a "mini-biological assessment" to the USFWS analyzing the effects to threatened and endangered species and requesting concurrence on the modification to the proposal originally described in the biological assessment.

In accordance with Section 106 of the National Historic Preservation Act, Glacier National Park notified the Montana State Historic Preservation Office (SHPO). The park also notified the

Advisory Council on Historic Preservation of the adverse effect finding; the Council did not provide notice that it would participate in the consultation process. A site visit with the Montana State Historic Preservation Officer was held on August 28, 2012. The NPS has documented a finding of “adverse effect” in a letter to the Montana SHPO dated January 6, 2014. A letter from the Montana State Historic Preservation Office, dated January 24, 2014, confirmed NPS’s “adverse effect” determination under §106 of the National Historic Preservation Act.

## **Native American Consultation**

Glacier National Park notified the Confederated Salish and Kootenai Tribes and the Blackfeet Tribal Business Council during scoping on November 7, 2012 as required by 36 CFR 800. No letters or emails were received. Park staff discussed the project during a meeting with the Blackfeet Tribal Historic Preservation Officer on December 6, 2012, and no concerns were identified at that time.

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

This EA is subject to a 30-day public comment period. The public was notified of the EA availability through news releases to a number of state and local media outlets and a letter and/or document to various agencies, tribes, groups businesses and individuals who have asked to receive notification or are otherwise required to get notification. The EA will be available for review on the park’s planning website at <http://parkplanning.nps.gov/SwiftcurrentBridge>. Copies of the EA will be provided to other interested individuals upon request.

During the 30-day public review period, the public is encouraged to submit their written comments to the 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 respond to substantive comments received during the public comment period in the decision document.

## **List of Preparers**

*Lauren Alley, Environmental Protection Assistant, GNP—assistance with document compilation and editing*

*Mark Biel, Natural Resources Program Manager, GNP—wildlife, document review, agency consultation*

*Danny Capri, Environmental Protection Specialist, FHWA—compilation of draft document*

*Chris Downs, Fisheries Biologist, GNP—fisheries, water resources, floodplains, document review*

*Jack Gordon, Landscape Architect, GNP—alternatives, document review*

*Lon Johnson, Cultural Resource Specialist, GNP—Cultural resources, document review, SHPO consultation*

*Mary Riddle, Chief of Planning and Environmental Compliance, GNP—NEPA compliance, technical adequacy and document review, guidance with agency consultation*

*Amy Secrest, Environmental Protection Assistant, GNP—document compilation and review; technical writing/editing /formatting; agency consultation; coordination of EA schedule and review*

*John Waller, Wildlife Biologist, GNP—Threatened and Endangered Species and Species of concern*

*Phil Wilson, Chief of Science and Resources Management, GNP—document review*

*Lisa Bate, Lead Wildlife Sciences Technician, GNP—wildlife distribution data reports*

*Dawn Lafleur, IPM/Restoration Biologist, GNP—vegetation and soils sections, document review*



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

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# **Appendix A**

**GLAC PR Number: 1430-14-MA-0001**

**MEMORANDUM OF AGREEMENT  
BETWEEN GLACIER NATIONAL PARK  
AND  
THE MONTANA STATE HISTORIC PRESERVATION OFFICER  
REGARDING DEMOLITION OF  
THE SWIFTCURRENT BRIDGE, MANY GLACIER HOTEL HISTORIC DISTRICT  
GLACIER NATIONAL PARK, GLACIER COUNTY, MONTANA**

WHEREAS the National Park Service, Glacier National Park (Park) proposes to demolish the Swiftcurrent Bridge in the Many Glacier Historic District; and

WHEREAS the Park has defined the undertaking's area of potential effect (APE) as the Many Glacier Hotel Historic District, Glacier National Park, Montana; and

WHEREAS the Park has determined that the undertaking will have an adverse effect on the Swiftcurrent Bridge, which has been determined eligible for listing in the National Register of Historic Places as a contributing resource to the Many Glacier Hotel Historic District; and

WHEREAS the Park has consulted with the Montana State Historic Preservation Officer (SHPO) pursuant to Section 106 of the National Historic Preservation Act (16 USC 470) and its implementing regulations, "Protection of Historic Properties" (36 CFR 800); and

WHEREAS the Park has notified the Advisory Council on Historic Preservation (Council) to determine its participation pursuant to Section 106 of the National Historic Preservation Act (16 USC 470) and its implementing regulations, "Protection of Historic Properties" (36 CFR 800), and the Council has chosen not to participate; and

NOW, THEREFORE; the Park and the SHPO agree that the undertaking will be implemented in accordance with the following stipulations in order to take into account the effect of the undertaking on historic properties.

## **STIPULATIONS**

The Park shall ensure that the following measures are carried out:

### **1) MITIGATION**

a) Prior to demolition, the Park will record the bridge to the standards of the Historic American Engineering Survey. HAER documentation will comply with the National Park Service standards set forth in the attached letter from the Heritage Partnerships Program, dated January 14, 2014. Original prints and associated documentation also will be provided to the Montana SHPO and the Glacier National Park Archives.

b) The Park will design and install two wayside exhibits at locations along the Many Glacier Road. The exhibits will interpret the transportation history of the Many Glacier Valley from pre-contact through the period of significance of the National Register-eligible Many Glacier Road. Text for the proposed wayside exhibits will be submitted to the Montana SHPO for review and approval prior to production.

c) The design of the replacement bridge has been carefully evaluated against the design philosophy of the historic bridge, and its compatibility with the architectural characteristics of the Many Glacier Hotel Historic District. Any changes to the 90 percent plans will be submitted to the SHPO for review.

### **2) DURATION**

This MOA will be null and void if its terms are not carried out within two (2) years from the date of its execution. Prior to such time, the Park may consult with the SHPO to reconsider the terms of the MOA and amend it in accordance with Stipulation 4.

### **3) DISPUTE RESOLUTION**

Should SHPO object at any time to any actions proposed or the manner in which the terms of this MOA are implemented, the Park shall consult with the SHPO to resolve the objection. If the Park determines that such objection cannot be resolved, the Park will:

A. Forward all documentation relevant to the dispute, including the Park's proposed resolution, to the Council. The Council shall provide the Park with its advice on the resolution of the objection within thirty (30) days of receiving adequate documentation. Prior to reaching a final decision on the dispute, the Park shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the Council and the SHPO, and provide them with a copy of this written response. The park will then proceed according to its final decision.

B. If the Council does not provide its advice regarding the dispute within the thirty (30) day time period, the Park may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, the Park shall prepare a written response that takes into account any timely comments regarding the dispute from the SHPO to the MOA, and provide them and the Council with a copy of such written response.

C. The Park's responsibility to carry out all other actions subject to the terms of this MOA that are not the subject of the dispute remain unchanged.

4) **AMENDMENTS**

This MOA may be amended when such an amendment is agreed to in writing by all signatories. The amendment will be effective on the date a copy signed by all of the signatories is filed with the Council.

5) **TERMINATION**

If any signatory to this MOA determines that its terms will not or cannot be carried out, that party shall immediately consult with the other party to attempt to develop an amendment. If within thirty (30) days (or another time period agreed to by all signatories) an amendment cannot be reached, any signatory may terminate the MOA upon written notification to the other signatories.

Once the MOA is terminated, and prior to work continuing on the undertaking, the Park must either (a) execute an MOA pursuant to 36 CFR § 800.6 or (b) request, take into account, and respond to the comments of the Council under 36 CFR § 800.7. The Park shall notify the signatories as to the course of action it will pursue.

6) **AGREEMENT CONTACTS**

For Glacier National Park: Jeff Mow, Superintendent, Glacier National Park, P.O. Box 128, West Glacier, Montana 59936. Phone: (406) 888-7943.

For the Montana State Historic Preservation Office: Mark Baumler, Ph.D., Montana State Historic Preservation Office, P.O. Box 201202, Helena, Montana 56620. Phone: (406) 444-7715.

EXECUTION OF THIS MEMORANDUM OF AGREEMENT by the Park and SHPO and implementation of its terms, evidences that the Park has afforded the SHPO and the Council an opportunity to comment on the Swiftcurrent Bridge demolition and its effect on the historic properties, and that the Park has taken into account the effect of the undertaking on historic properties.

**SIGNATORIES**

\_\_\_\_\_  
Jeff Mow, Superintendent  
Glacier National Park

\_\_\_\_\_  
Date

\_\_\_\_\_  
Mark Baumler, Ph.D.  
Montana State Historic Preservation Officer

\_\_\_\_\_  
Date

National Park Service  
U.S. Department of the Interior

Glacier National Park  
Waterton-Glacier International Peace Park  
Montana

**STATEMENT OF FINDINGS FOR FLOODPLAINS**  
*Swiftcurrent Bridge Replacement*

Glacier National Park, Montana

Recommended by: \_\_\_\_\_  
Jeff Mow  
Superintendent, Glacier National Park

Concurred by: \_\_\_\_\_  
Forrest E. Harvey  
Chief, Water Resources Division

Approved by: \_\_\_\_\_  
Sue Masica  
Intermountain Regional Director  
National Park Service

## INTRODUCTION

Glacier National Park has prepared and made available an Environmental Assessment (EA) analyzing alternatives for replacing the Swiftcurrent Bridge, located at the outlet of Swiftcurrent Lake within the Many Glacier developed area (Figures 1 & 2). The Swiftcurrent Bridge is rapidly losing its structural integrity. The bridge deck is severely damaged and the abutments and piers are in disrepair. Ice break up in Swiftcurrent Lake results in more wear and stress to the piers and abutments. Utilities for sewer, water, phone and electricity are intertwined and partially encased in conduit alongside the deck, failing to meet code for separation and detracting from the aesthetic appearance of the bridge. Glacier National Park is proposing to replace the Swiftcurrent Bridge with a clear span bridge. Executive Order 11988 "Floodplain Management" requires the National Park Service (NPS) and other agencies to evaluate the likely impacts of actions in floodplains. NPS Director's Order #77-2: Procedural Manual 77-2: Floodplain Management provides NPS policies and procedures for complying with EO 11988 (NPS 2003). This Statement of Findings (SOF) has been prepared in accordance with the NPS floodplain management procedures.

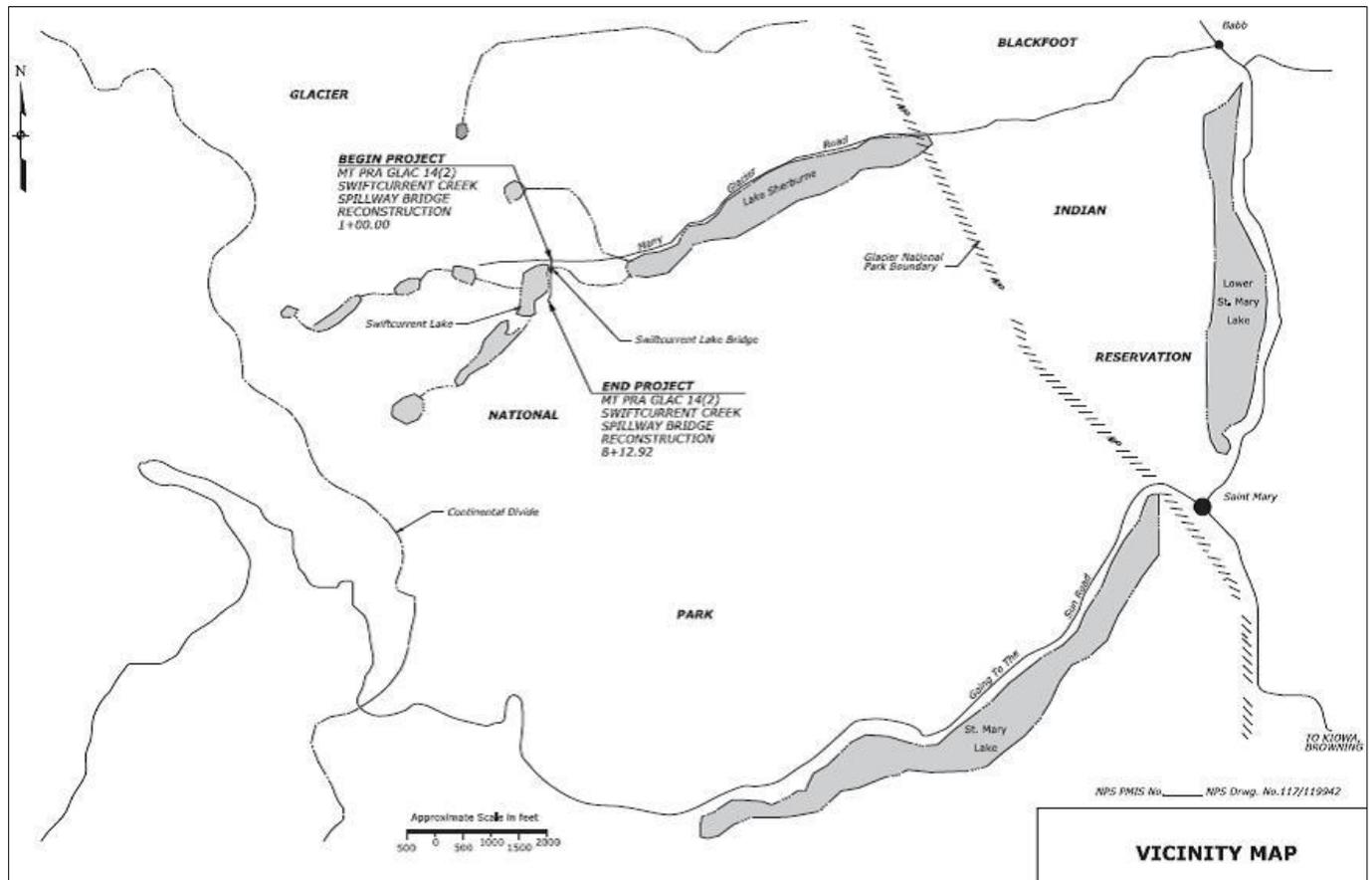


Figure 1: Swiftcurrent Bridge vicinity map, Glacier National Park, Montana.

## **PROPOSED ACTION**

Under the proposed action, the existing 75-foot Swiftcurrent Bridge, composed of five spans and supported on four stone masonry piers, would be replaced with a 85-foot single span bridge on the existing alignment (Figure 3). New abutments would be constructed at the outer edges of the stream channel behind the existing abutments. The four interior piers and existing abutments would be removed to improve the bridge's hydraulic capacity. The new bridge would be designed to preserve to the extent possible the visual and aesthetic elements of the original historic bridge, including placement near existing elevation in order to match the existing historical profile. The new bridge would match the existing bridge width of 28 feet-8 inches, and would replicate two 9-foot lanes, a 3-foot wide sidewalk, and a 5-foot bridle path. The new abutments would be supported on deep foundations.

The existing bridge deck may be removed without the need for work crews or equipment to access the creek, but some in-water work involving hand-tools and an excavator would be required to remove the concrete piers and salvage the stone masonry, though no excavation of the lake bed would occur.

Following demolition, the abutments for the new bridge would be constructed. Because the new bridge would be longer than the existing bridge, excavation for the abutments would be behind the existing abutments. A relatively minor amount of riprap would armor and protect the abutments.

The Swiftcurrent Bridge demolition and construction work may be scheduled to occur twenty-four hours a day, seven days a week during the fall construction period of late September through the first week of December. Additional deck work, paving, and stone masonry work would occur in late summer/fall of the following season, limited to daytime hours.



**Figure 2:** Swiftcurrent Bridge, Glacier National Park, Montana.

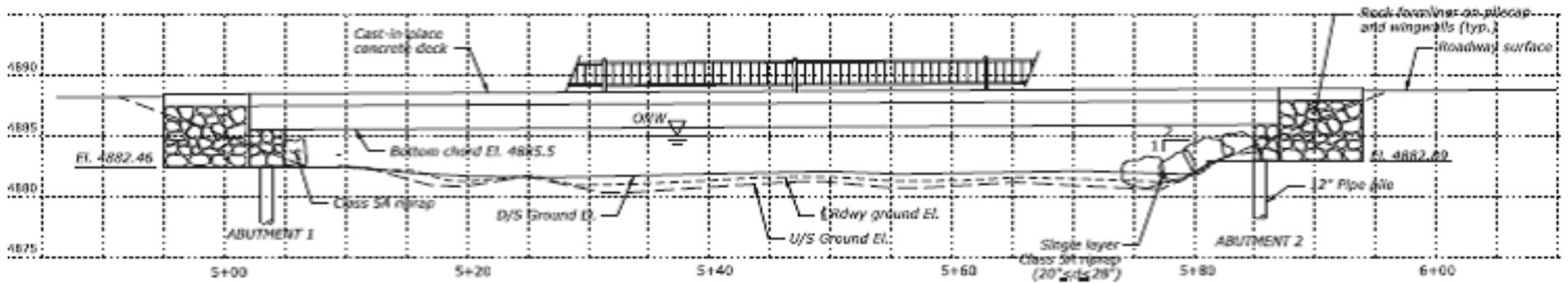


Figure 3: Preliminary design layout for the new Swiftcurrent Bridge; typical bridge section depicting elevations.

## **SITE DESCRIPTION**

### **Physical Setting**

The project site is located on the eastern flank of the Continental Divide at an elevation of approximately 4900 feet. The existing bridge is located at the outlet of Swiftcurrent Lake where the flow passes under the bridge and shortly thereafter transitions into a waterfall along a steep chute before reaching a plunge pool located at an elevation approximately 20 feet below the lake elevation.

The site is located approximately 11 miles southwest of Babb, Montana at a latitude of 48°47'57" and a longitude of 113°39'21". The climate of the valley is relatively mild in the summer and cold in the winter with mean monthly temperatures ranging from 59 degrees Fahrenheit in July to 13 degrees Fahrenheit in January. Average annual precipitation at Swiftcurrent Lake is about 39.6 inches per year whereas higher elevations may receive up to 6.6 feet per year. Average annual runoff for the basin is 62.4 inches.

Mast and Turk (1999) describe the geology of the basin and note, "The bedrock is very resistant to weathering and supplies little sediment to the stream." This is consistent with the history of the existing bridge at the site during which two significant floods occurred in 1964 and again in 2006 and neither one caused any significant scour or undermining of the bridge foundations or piers.

### **Hydrology**

Swiftcurrent Creek drains approximately 31 square miles upstream of Swiftcurrent Lake. The basin consists of rugged mountainous terrain on the eastern flank of the Continental Divide. Swiftcurrent Creek is a perennial, high-gradient mountain stream which eventually flows into the St. Mary River. The basin lies within the Saskatchewan River Basin.

The U.S. Geological Survey (USGS) maintains a long-term recording station for lake levels on Swiftcurrent Lake, adjacent to the existing bridge. In addition, the USGS conducts an ongoing program of field measurements of flow immediately downstream of the lake outlet in order to maintain a stage discharge relationship. The USGS utilizes the stage discharge curve to report streamflow along with lake levels at this gaging station.

### **Fisheries**

The entire basin upstream of the proposed project site is believed to have been historically fishless due to the waterfall located immediately downstream of the project site. This is the typical "hanging-valley" situation that developed in many of the drainages on the east side of the park as the glaciers receded. Historically, Swiftcurrent Lake has been stocked with brook trout, cutthroat trout, Arctic grayling, and rainbow trout. It currently supports introduced populations of brook trout and kokanee, although NPS records of stocking kokanee do not exist.

Sherburne Reservoir is located immediately downstream of the project area. The reservoir was formed by the construction of Sherburne Dam, located just outside of the park. The reservoir is a Bureau of Reclamation irrigation storage project. Water is stored in the winter and spring and released to irrigate farmland in eastern Montana in the summer. Construction of the reservoir inundated several miles of existing shallow lake/stream habitat. The reservoir is operated solely for water storage and release and as a result it has severe annual fluctuations in water elevations. This makes it difficult for native fisheries to reproduce successfully and recruit adults to the fishery. However, the reservoir is home to a number of native species including northern pike

(*Esox Lucius*), bull trout (*Salvelinus confluentus*), mountain whitefish (*Prosopium williamsoni*), lake whitefish (*Coregonus clupeaformis*), and longnose suckers (*Catostomus catostomus*).

## JUSTIFICATION FOR USE OF THE FLOODPLAIN

By nature of the intent of the project, addressing the bridge’s structural concerns in a manner compatible with the historic character of the current bridge and the Many Glacier Hotel Historic District, the new bridge must be located within the floodplain.

### Investigation of Alternative Sites

Given the historic character of the Swiftcurrent Bridge and its status as a contributing resource to the Many Glacier Hotel Historic District, combined with the constrictions presented by the natural and built environment in this area (between a lake and waterfall and an existing alignment surrounded by historic structures), alternatives that deviated from the existing alignment were not investigated. There are no alternative sites that would avoid having to cross Swiftcurrent Creek or Swiftcurrent Lake.

## SITE-SPECIFIC FLOOD RISK

The Swiftcurrent Bridge and portions of the surrounding Many Glacier developed area are located within the 100-year floodplain of Swiftcurrent Lake. Two significant floods occurred in 1964 and 2006, both resulting in overtopping of the existing bridge and some flooding of the historic Many Glacier Hotel, which is also located within Swiftcurrent Lake’s floodplain. Flooding has and could occur within the Many Glacier developed area, but there would be enough time to issue a flood warning and evacuate people to safe areas should the need arise (NPS 2004). The Many Glacier Emergency Evacuation Plan (2003) contains guidelines for managing an evacuation of the Many Glacier area, including in the event of a flood (Section 8.3).

Table 1. HECRAS Model Output for Swiftcurrent Creek Bridge, Existing and Proposed

Flow Recurrence Interval (yr)	Discharge (cfs)	Existing Bridge		Proposed Bridge		
		Water Surface Elevation (ft)	Channel Velocity at Bridge (fps)	Water Surface Elevation (ft)	Channel Velocity at Bridge (fps)	Water Surface Elevation difference* (ft)
2	1006	4885.78	8.59	4885.15	5.55	-0.63
10	1961	4887.72	8.29	4887.04	7.23	-0.68
50	3796	4890.04	9.16	4890.04	9.16	0.00
100	5032	4890.92	8.23	4890.89	8.14	-0.03
500	9632	4894.21	5.63	4894.20	5.58	-0.01

\*This is the difference between the lake’s surface elevation for the existing and proposed bridge. A negative value indicates a lake level decrease due to the proposed bridge relative to the existing bridge.

## MITIGATION

Replacing the existing bridge with a new clear span bridge would minimally mitigate existing adverse flood hazards to developments along Swiftcurrent Lake. The removal of the existing bridge’s piers would remove some restrictions to flood flows and slightly improve or maintain flood flow capacity. The new bridge has been designed for structural durability and minimal resource impacts. The new bridge would be 10 feet longer than the existing bridge, reducing

floodplain impacts. In-water work would be completed during the fall at low flow periods and equipment would not be operated (driven) below the water surface elevation, but would need to reach into the water. Equipment used in/over the water (such as excavators that may need to reach into the lake) would use non-petroleum based lubricants (e.g. vegetable oil based products) deemed safe for working in and around waterways.

## **SUMMARY**

The preferred alternative was designed to achieve project objectives while considering the floodplain values of the area. The proposed action would maintain an existing obstacle to flood flows, but replacing the existing bridge with a clear span bridge would slightly reduce the adverse impacts on streamflow and floodplains. Due to the nature of the project (addressing the bridge's structural concerns in a manner compatible with the historic character of the current bridge and the Many Glacier Hotel Historic District), placement of the new bridge in the floodplain is unavoidable. Therefore, the NPS finds this proposed action is consistent with the policies and procedures of NPS Director's Order #77-2: Procedural Manual 77-2: Floodplain Management, which provides NPS policies and procedures for complying with Executive Order 11988.

## **REFERENCES**

Mast, M.A., and Turk, J.T. 1999. "Environmental characteristics and water quality of Hydrologic Benchmark Network stations in the West-Central United States, 1963-95: U.S. Geological Survey Circular 1173-C, 105p.

National Park Service. 2003. Director's Order 77-2. Floodplain Management. Washington D.C.

\_\_\_\_\_. 2004. Final commercial services plan and final environmental impact statement, Glacier National Park. U.S. Department of the Interior, National Park Service, Glacier National Park, West Galcier, MT.