

**National Park Service
U.S. Department of the Interior**

**Glacier National Park
Waterton-Glacier International Peace Park
Montana**



ROSE CREEK FISH BARRIER REMOVAL AND BRIDGE REPLACEMENT FINDING OF NO SIGNIFICANT IMPACT

Background

In compliance with NEPA, the National Park Service (NPS) prepared an environmental assessment (EA) to examine alternatives and environmental impacts associated with a proposal to 1) remove an abandoned weir that inhibits upstream fish migration along lower Rose Creek and 2) replace the Rose Creek Bridge with a clear span bridge.

Fish passage on lower Rose Creek has been blocked for decades by an abandoned weir (a small dam or water intake structure that allows a shallow overflow of water) just above the Rising Sun developed area and campground. Additionally, the long-term structural stability of the Rose Creek Bridge on the Going-to-the-Sun Road (GTSR) is threatened by sediment scouring on the downstream side of a concrete slab spanning the width of the stream beneath the bridge. The bridge's abutments are showing signs of settling, its span is too narrow to accommodate natural shifts in the stream channel over time, and maintenance will increase as the concrete ages. The concrete slab also inhibits fish passage during periods of low stream flow, and the bridge's appearance is not compatible with the historic design characteristics of the GTSR, a notable National Historic Landmark.

Removal of the weir on Rose Creek and replacement of the Rose Creek Bridge is necessary to restore access to historic spawning and rearing habitat for native fish and improve stream flow and sediment transport. Removing the weir will maximize the amount of available fish habitat in the drainage, allowing native fish access to over one-half mile of additional high-quality habitat. Replacing the Rose Creek Bridge with a clear span bridge will address the structural concerns of the existing bridge, remove an additional barrier to upstream fish passage, and improve sediment transport along lower Rose Creek. Additionally, the new bridge will be more compatible with the historic design characteristics of the GTSR. An EA was required for the replacement of the Rose Creek Bridge, since the action was not analyzed in the environmental impact statement for the GTSR Rehabilitation Project.

Selected Action

Alternative B, removal of the weir on Rose Creek and replacement of the Rose Creek Bridge, is the National Park Service's preferred alternative because it best meets the purpose and need for the project as well as the project objectives to:

1. Restore fish passage on Rose Creek to provide access to historic spawning and rearing habitat for native fish.
2. Improve sediment transport along lower Rose Creek.
3. Address the structural concerns and incompatible historic design elements of the Rose Creek Bridge.

Removal of the weir on Rose Creek. Under Alternative B, the weir on Rose Creek will be removed. The EA originally proposed using expansive demolition grout to fracture the structure. New information on the possible ineffectiveness of demolition grout has since become available, and mechanical means of fracturing the weir may be necessary instead of or in combination with grout. The level of impacts to park resources analyzed in the EA has not changed.

Therefore, the weir will be fractured and demolished with expansive demolition grout and or mechanical means, such as a jackhammer or other equipment capable of breaking reinforced concrete. Once the weir is broken and demolished, the concrete and rebar will be removed by an excavator or similar equipment. Specialized saws and or other tools will be used to cut the rebar and reinforcing steel. Expansive grout may not be effective on reinforced concrete nor in cold, wet conditions; if expansive grout is used, it will be removed from the stream along with the concrete and rebar. The removal of the weir will occur in late summer or fall when stream flows are lowest and will likely require one to two weeks. Equipment will access the creek from the water tank road. Equipment capable of "walking" up the stream channel with minimal direct contact with the streambed will be used, and or equipment will be supported by some form of work pad as necessary to minimize impacts to the streambed. Loose boulders within the streambed may be temporarily moved out of the path of machinery; any removed boulders will be replaced. Some sediment on the weir's upstream side could be removed to facilitate removal of the structure, which will reduce the amount of sediment released downstream once the weir is taken out. The concrete will be removed until it is level with the streambed or no longer obstructs fish passage. Protruding segments of abandoned metal water pipe will be cut level with the streambed. The removed concrete and rebar will either be temporarily stockpiled onsite and hauled out one load at a time, or placed in a large container that will be hauled out when full and brought back for additional loads. With either method, approximately 12 trips are anticipated. The project will be funded by the U.S. Fish and Wildlife Service.

The Rose Creek Bridge. Under Alternative B, the Rose Creek Bridge will be replaced with a new, approximately 85 foot-long, concrete girder, clear span bridge. The existing bridge will be demolished and all concrete and reinforcing steel will be removed and hauled to a disposal site outside the park. The existing girders may be removed without the need for work crews or equipment to access the creek, but some in-stream work involving hand-tools and an excavator will be required to cut the piers and concrete sill into manageable pieces and remove them. The stream may be temporarily diverted as necessary during demolition and removal of the concrete sill, and some native material may be excavated. Once the piers and sill are removed, the stream channel may be graded as necessary to match upstream and downstream elevations, and shaped to match adjacent existing conditions.

Following demolition, the abutments for the new bridge will be constructed. Riprap will likely be required to armor and protect the abutments. An approximate total of 1200 cubic yards of native material above the ordinary high water mark and 210 cubic yards of native material below the ordinary high water mark will likely be excavated. Recontouring the banks for riprap and placing the material may require equipment within the stream channel. Less than one acre of soil and vegetation will likely be disturbed. New concrete girders will be fabricated off-site, trucked to the project area, and put in place by cranes on either side of the bridge. The abutments will be backfilled and the approach roadways will be constructed. A cast-in-place concrete deck will be poured and the railing and wing walls will be faced with ashlar or rubble stone, making the appearance of the new bridge more compatible with the historic design characteristics of the Going-to-the-Sun Road.

Demolition of the bridge will begin in mid to late September. Bridge demolition could occur during the same time period as the removal of the weir, and construction of the abutments and installation of the new girders could extend through December, with all in-water work being

completed during the low-flow period. Work could occur at night to accelerate the schedule. Rock facing and stone masonry, as well as any other remaining work, will take place early the following spring. During the bridge replacement, traffic on the GTSR will be detoured over the bridge to Rising Sun Campground. The new bridge will be designed to easily accommodate bears and other terrestrial wildlife trying to move through the area. Bat boxes will be placed underneath the bridge to provide roosting areas for bats. The bridge project will be funded by the Federal Lands Highway Program as part of the GTSR Rehabilitation Project.

Permits for the projects will be obtained from the Army Corps of Engineers. A letter dated August 4, 2011 from the Army Corps of Engineers stated that the project may qualify for a Nationwide Permit 27. A 124 Permit from Montana Fish, Wildlife and Parks and a 318 authorization from Montana Department of Environmental Quality will also be obtained.

Following implementation of both projects, fish sampling will be conducted annually in Rose Creek for approximately five years to document any expanded use of Rose Creek by native fish. Sediment transport will be assessed through the establishment of stream channel cross-sections and substrate assessments.

Mitigation Measures

The following mitigation measures were developed to minimize the degree and/or severity of adverse effects and will be implemented:

Fisheries and Aquatic Threatened Species and Species of Concern

- Electrofishing to remove fish will occur in the project vicinity immediately prior to excavation activities.
- Work will occur during low water periods, minimizing sediment generation and physical habitat disturbance.
- Any disturbance to physical stream habitat will be repaired upon completion of the project.
- Work pads will be used with heavy equipment as necessary to minimize sediment generation and streambed disturbance.
- Surveys for amphibians will be conducted immediately prior to excavation and in-stream work, and any amphibians encountered will be moved out of the immediate work area.

Water Resources

- Specific stream access points for heavy equipment will be identified to minimize stream bank damage and bed disturbance.
- Work pads will be used with heavy equipment as necessary to minimize sediment generation and streambed disturbance.
- Water will be temporarily diverted as necessary away from areas of excavation by sandbags or a similar barrier.

Wildlife

- The new bridge design will provide clearance for terrestrial wildlife to pass underneath the structure during low-water periods.
- Work crews will be trained on appropriate behavior in the presence of wildlife and on proper storage of food, garbage, and other attractants.
- Hauling trucks (such as dump trucks, tractor trailers, and other large trucks hauling construction debris and heavy equipment) will not operate during late evening, nighttime, or early morning hours (from one hour before sunset to one hour after sunrise) to reduce the risk to wildlife of being struck by a vehicle.
- Bridge work scheduled for the spring will not begin until after April 1, in keeping with the park's road closure and core security periods for wildlife protection.

- In the event that golden eagles are nesting within 800 meters of the project area when work is underway, work will not begin until one hour after sunrise and will cease one hour before sunset between April 1 and August 1. This restriction will continue beyond August 1 if fledging is late, and will be lifted early if the nest is unsuccessful.

Vegetation

- Glacier National Park's Best Management Practices will be implemented to minimize the extent of impacts.
 - Disturbance to vegetation will be avoided as much as possible and contained to as small a footprint as possible while meeting project objectives.
- A vegetation inventory will be completed at the start of the project. If restoration is necessary following project completion, native species from the site will be utilized for revegetation seeding and planting efforts. Plant species density, abundance, and diversity will be restored as nearly as possible to prior conditions for non-woody species.
- Non-native invasive plant infestations near the bridge will continue to be treated on a yearly basis, with emphasis on disturbed areas at both the bridge and weir for a minimum of three years following project completion.

Soils

- Glacier National Park's Best Management Practices will be implemented to minimize the extent of impacts.
 - Disturbance to soils will 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 will be implemented.
- Any ground surface temporarily disturbed during construction will be aerated and replanted with native vegetation to reduce compaction and prevent erosion.
- Following bridge construction, all disturbed top soil will be salvaged, stored, and used to restore the area.

Cultural Landscapes

- The new Rose Creek Bridge will be designed to meet the Secretary of the Interior's Standards for the Treatment of Historic Properties.

Visitor Use and Experience

- Bridge demolition and construction will not begin until after the peak visitor season, when concessions operations and the campground at Rising Sun have closed for the season and traffic on the GTSR is at a decreased level.
- During bridge demolition and construction, traffic on the GTSR will be redirected over the Rising Sun Campground bridge.

Alternatives Considered

The EA evaluated two alternatives, including the no action and one action alternative. Under Alternative A, no action, there will be no change to current conditions; the weir on Rose Creek will not be removed and the Rose Creek Bridge will not be replaced. Alternative B, removal of the weir and replacement of the Rose Creek Bridge, is the preferred alternative, as described in the previous section. One previously identified alternative, two alternative methods for removing debris from the weir project area, two alternative methods for fracturing the weir, and one alternative method for accessing the weir, were considered but dismissed.

Environmentally Preferable Alternative

According to the CEQ regulations implementing NEPA (43 CFR 46.30), the environmentally

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

Alternative B (removal of the weir and replacement of the bridge) is the environmentally preferable alternative for several reasons: 1) The amount of accessible spawning and rearing habitat for native fish, including the threatened bull trout (*Salvelinus confluentus*), will increase along lower Rose Creek; 2) sediment transport and stream function along lower Rose Creek will improve and more closely resemble natural conditions; 3) a bridge that is showing signs of structural instability will be replaced with a new, clear span bridge that can accommodate shifts in the stream channel over time; 4) a bridge with features that are incompatible with a National Historic Landmark, the GTSR, will be replaced with one that is more compatible with the historic design principles of the GTSR.

By contrast, Alternative A (No Action) is not the environmentally preferable alternative because 1) native fish will remain blocked from accessing historic spawning and rearing habitat; 2) the natural morphology of the lower Rose Creek channel will be degraded for the long-term by continued sediment scouring; 3) a bridge that has begun to show signs of structural instability will not be replaced; 4) the existing Rose Creek Bridge will remain incompatible with the historic design characteristics of the GTSR, a National Historic Landmark; and 5) an abandoned concrete weir will remain in an otherwise pristine setting.

Why the Selected Action Will Not Have a Significant Effect on the Human Environment

As defined in 40 CFR §1508.27, significance is determined by examining the following criteria:

Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.

Implementation of the preferred (selected) alternative will result in some adverse impacts; however, the overall benefit of the project, particularly to fisheries and aquatic threatened and species of concern, water resources, floodplains, soils, and historic structures and cultural landscapes, outweighs these negative effects. The adverse effects are summarized as follows: Temporary turbidity and habitat disturbances during project implementation will have negligible to minor, short-term adverse effects to fisheries, including bull trout (federally listed as threatened under the Endangered Species Act), westslope cutthroat trout (*Oncorhynchus clarkii lewisi*), (a state listed Species of Concern), and burbot (*Lota lota*) (a state listed Potential Species of Concern). Minor to moderate, short-term adverse impacts to water resources will occur from a temporary release of upstream sediments, limited use of heavy equipment in the stream channel, and recontouring of the streambed. There will be negligible, long-term adverse impacts to floodplains because of the new bridge abutments, which will displace some water during flood flows over short distance of the stream; and negligible, short-term adverse impacts from disturbances during project implementation. Disturbance, compaction, and the loss of some individual plants will have minor, short-term adverse impacts on vegetation. Degradation, compaction and disturbance will have minor, short-term adverse impacts on soils.

The project will benefit native fisheries for the long term because it will increase the availability of historic stream habitat. Beneficial impacts to westslope cutthroat trout will be minor, since opportunities for westslope cutthroat trout populations to expand will remain limited by other factors, and beneficial impacts to burbot will be negligible to minor, as the overall burbot

population within St. Mary Lake will not be measurably affected. The project will primarily benefit bull trout by providing an opportunity for the species to colonize areas upstream of the weir and establish a reproducing population; beneficial impacts to bull trout will be moderate. There will be minor, long-term benefits to water resources from restoration of a more natural sediment transport regime. The removal of restrictions to flood flows along lower Rose Creek will have negligible to minor, long-term beneficial impacts to floodplains, and improved sediment transport and reduced stream bank soil erosion will have minor, long-term beneficial impacts to soils. The new Rose Creek Bridge will appear more compatible with the historic design characteristics of the GTSR and have a minor, long-term beneficial impact on historic structures and cultural landscapes.

The degree of effect on public health or safety: The preferred alternative will not affect public health and safety.

Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas: Rose Creek is a tributary of the St. Mary River drainage, an ecologically important system for native fish species, including federally and state listed species such as bull trout and westslope cutthroat trout. The St. Mary Valley also contains valuable habitat for wildlife, including federally and state listed species such as grizzly bears, Canada lynx, wolverine, and bald and golden eagles. The weir is within approximately 50 meters (approximately 164 feet) and the bridge is within approximately 75 meters (approximately 246 feet) of the recommended wilderness boundary, and the project area is within a floodplain. No wetlands, prime farmlands, or wild and scenic rivers will be affected by the project.

The Rose Creek Bridge is on the Going-to-the-Sun Road, which is a National Historic Landmark listed in the National Register of Historic Places; the road is Glacier National Park's only fully documented cultural landscape. The Rising Sun Auto Camp Historic District and the Rising Sun Campground Campender's Cabin are listed in the National Register and are physically removed from but visually within the Area of Potential Effect for the bridge replacement project.

The degree to which effects on the quality of the human environment are likely to be highly controversial: The proposal to remove the weir on Rose Creek and replace the Rose Creek Bridge was not controversial during the environmental process, and the effects of the project are not expected to generate any future controversy. Eight comment letters were received on the EA; seven were supportive of the two projects and one letter from the Montana Department of Environmental Quality stated that a 124 permit will be required through Montana Department of Fish, Wildlife, and Parks.

The degree to which the possible effects on the quality of the human environment are highly uncertain or involve unique or unknown risks: The environmental process has not identified any effects that are highly uncertain or may involve unique or unknown risks.

The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration: The preferred alternative does not set a precedent for future actions with significant effects, nor does it represent a decision in principle about a future consideration.

Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into

small component parts: Cumulative effects were analyzed in the EA and no significant cumulative impacts were identified.

The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed on National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources:

The Rose Creek Bridge is on the Going-to-the-Sun Road, a National Historic Landmark listed in the National Register of Historic Places. The Rising Sun Auto Camp Historic District and the Rising Sun Campground Campground's Cabin are listed in the National Register and are physically removed from but visually within the Area of Potential Effect for the bridge replacement. The Rose Creek Bridge and the weir do not meet the criteria for listing in the National Register of Historic Places, however, and are not historic. The action alternative will not adversely affect properties listed on the National Register of Historic Places, it will not result in the loss or destruction of significant scientific, cultural, or historical resources, and it will not affect ethnographic resources. The new Rose Creek Bridge will appear more compatible with the historic design characteristics of the Going-to-the-Sun Road and have minor, beneficial, long-term impacts on historic structures and cultural landscapes.

The Montana State Historic Preservation Office (SHPO) has concurred with the park's determination that neither the weir nor the Rose Creek Bridge meets the criteria for listing in the National Register of Historic Places. Removal of the weir will therefore have no effect on historic properties. For the bridge replacement, the SHPO has provided preliminary agreement with a finding of no adverse effect (email dated November 18, 2011). Design and construction specifications will be submitted to the SHPO for review in order to complete Section 106 consultation. If during the course of design an unavoidable adverse effect is determined, the NPS would continue consultation with the SHPO and the Advisory Council on Historic Preservation to determine mitigation requirements. The NPS would also re-evaluate whether additional NEPA compliance is required.

The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the

Endangered Species Act of 1973: Under Section 7 of the Endangered Species Act, the determination for bull trout (*Salvelinus confluentus*) is "may affect, but not likely to adversely affect". Impacts to the threatened grizzly bear (*Ursus arctos*) and the threatened Canada lynx (*Lynx Canadensis*) will be negligible from temporary noise and disturbances during project implementation; the Section 7 determination for grizzly bears and Canada lynx is "no effect". There are no known locations of the threatened water howellia (*Howellia aquatilis*) or the threatened Spalding's catchfly (*Silene spaldingii*) within the park; the Section 7 determination for water howellia and Spalding's catchfly is therefore "no effect". There will be no effect to either of the park's two Candidate Species, wolverine (*Gulo gulo*) and meltwater stonefly (*Lednia tumana*). In a letter dated March 14, 2012, the U.S. Fish and Wildlife Service concurred with the park's determination that the project *may affect but is not likely to adversely affect* bull trout.

Westslope cutthroat trout, a state-listed Species of Concern, and burbot, a state-listed Potential Species of Concern, will be temporarily adversely impacted by the project but beneficially affected over the long-term. No other state-listed species of concern will be measurably affected; the project will be localized, of short duration, and will occur after the sensitive nesting and denning period. The *Montana Natural Heritage Program* website, which is part of Montana's official state website and describes the range and distribution of state-listed species of concern, was accessed on July 20, 2011.

Whether the action threatens a violation of Federal, state or local law or requirements imposed for the protection of the environment. The action will not

violate any federal, state, or local laws or environmental protection laws. Park staff met onsite with a representative from the Army Corps of Engineers on July 19, 2011, to discuss the project. Permits for the work will be obtained; a letter dated August 4, 2011 from the Army Corps of Engineers stated that the project may qualify for a Nationwide Permit 27. A 124 permit from Montana Fish, Wildlife, and Parks and a 318 authorization from the Department of Environmental Quality will also be obtained.

Public Involvement and Native American Consultation

The environmental assessment was made available for public review and comment during a 30-day period ending January 23, 2012. The announcement was also posted on the National Park Service's public comment website. Letters were sent to recipients on the park's EA mailing list and federal, state, and local agencies, including the U.S. Fish and Wildlife Service, Montana Fish, Wildlife and Parks, the Montana State Historic Preservation Officer (MTSHPO), the Advisory Council for Historic Preservation (ACHP), the Blackfeet Tribal Business Council, and the Confederated Salish and Kootenai Tribe.

Eight comment letters were received during the EA review period. Seven letters expressed support for the proposal, and one letter from the Montana Department of Environmental Quality stated that a 124 permit will be required through Montana Department of Fish, Wildlife, and Parks. No comments were received from the Blackfeet Tribe; in a personal communication, the Tribal Preservation Office with the Confederated Salish and Kootenai Tribes said they had no concerns with the project. Substantive comments addressed the level of benefit to bull trout, the length of the sampling period for fish and sediment following the project, the dismissal of wildlife from further analysis, bat boxes and current bat use of the existing bridge, the need for rip rap at the new bridge's abutments, and an incorrectly formatted reference. These comments are addressed in the Errata Sheets attached to this FONSI. The FONSI and Errata Sheets will be sent to all commenters.

The U.S. Fish and Wildlife Service concurred on March 14, 2012 with the park's Biological Assessment and the "may affect, not likely to adversely affect" determination for bull trout. The Army Corps of Engineers did not comment on the EA, but commented on the project during the public scoping period; in a letter dated August 4, 2011, the corps stated that the project may qualify for a Nationwide Permit 27.

Conclusion

As described above, the preferred alternative does not constitute an action meeting the criteria that normally requires preparation of an environmental impact statement (EIS). The preferred alternative will not have a significant effect on the human environment. Environmental impacts that could occur are limited in context and intensity, with adverse and beneficial impacts that range from negligible to moderate, short to long-term, and site-specific to local. There are no unmitigated adverse effects on public health, public safety, threatened or endangered species, sites or districts listed in or eligible for listing in the National Register of Historic Places, or other unique characteristics of the region. No highly uncertain or controversial impacts, unique or unknown risks, significant cumulative effects, or elements of precedence were identified. Implementation of the action will not violate any federal, state, or local environmental protection law.

Based on the foregoing, the National Park Service has determined that an EIS is not required for this project and thus will not be prepared.

Approved:

for *Laura H. Joss*
John Wessels
Regional Director, Intermountain Region, National Park Service

5/4/12
Date

ERRATA SHEETS

ROSE CREEK FISH BARRIER REMOVAL AND BRIDGE REPLACEMENT GLACIER NATIONAL PARK

According to NPS policy, substantive comments are those that 1) question the accuracy of the information in the EA, 2) question the adequacy of the environmental analysis, 3) present reasonable alternatives that were not presented in the EA, or 4) cause changes or revisions in the proposal.

Six comments received during public review of the EA were considered substantive and are addressed below in the *Responses to Comments* section. Substantive comments questioned the level of benefit to bull trout, the length of the sampling period for fish and sediment following the project, the dismissal of wildlife from further analysis, bat boxes and current bat use of the existing bridge, the need for rip rap at the new bridge's abutments, and identified an incorrectly formatted reference. One substantive comment has resulted in a minor text change to the references section of the Statement of Findings, and has been addressed in the *Text Changes* section of the Errata Sheets.

TEXT CHANGES

Several text changes have been made following the NPS's determination that fracturing the weir may require mechanical means in addition to or instead of expansive demolition grout, which was originally proposed in the EA. Other text changes have been made to correct minor technical errors and make clarifications. One substantive comment from public review has resulted in a minor change to the references section of the Statement of Findings. Italicized and underlined text indicates the section in the EA that has been corrected or altered. Strikeout is used to show text that has been struck from the EA. Bold text is used to show new text and text that replaces stricken text.

p. 13, Impact Topics Dismissed From Further Analysis, Recommended Wilderness. **Noise during project implementation would be temporary, but would likely be audible within recommended wilderness. But due to the short duration of the project, impacts to the defining attributes of wilderness character would not be measurable;** ~~and recommended wilderness is therefore dismissed from further analysis.~~

p. 14, Impact Topics Dismissed From Further Analysis, Natural Soundscapes. ~~The removal of the weir on Rose Creek would likely generate noise ranging between 90 and 95 dBA 50 feet from the source over a period of one to two weeks. Noise produced during the removal of the weir would depend on the method(s) used to fracture and demolish the structure. Expansive demolition grout would likely produce the least audible, least intrusive level of noise, although drilling the required holes into the concrete could produce higher levels of continuous noise for up to approximately five days. Breaking the weir apart mechanically could produce more or less continuous noise for up to approximately five days. A jackhammer, for example could be used and would produce noise at approximately 89 dBA 50 feet from the source. Heavy equipment used for hauling away debris would produce noise ranging between 90 and 95 dBA 50 feet from the source over a period of one to two weeks for much of the duration of the project.; the use of expansive demolition grout to fracture the concrete rather than mechanically breaking it apart would minimize the amount of noise....~~

... If a jackhammer is used to break apart the weir, the noise would be expected to

attenuate to approximately 50 dBA within approximately 0.6 mile. ...

pp. 17-18, Alternatives Considered, Alternative B: Preferred Alternative, Removal of the weir on Rose Creek. The weir would be fractured **and demolished** with expansive demolition grout **and or mechanical means, such as a jackhammer or other equipment capable of breaking reinforced concrete.** ~~and the~~ **Once the structure is broken and demolished, the concrete and rebar** large pieces would be removed by an excavator or similar equipment. Specialized saws **and or other tools** would cut the rebar and reinforcing steel...

... Expansive grout does not produce airborne debris or explosive noise, and can be used above or below the surface of water-; **but expansive grout may not be sufficiently effective on reinforced concrete nor in cold, wet conditions. If expansive grout is used, it** ~~The grout~~ would be removed from the stream along with the concrete and rebar. The removal of the weir would occur in ~~September~~ **the late summer or fall** when stream flows are lowest and would likely require one to two weeks...

... During excavation, some sediment on the weir's upstream side could be removed to **facilitate removal of the weir, which would** reduce the amount of sediment released downstream once the weir is removed. ~~Whether sediment is removed would depend on how well the material is being naturally transported and redistributed by the stream channel. It is likely that~~ **much of the** sediment generated by the project would be transported and redistributed during high water the following spring, **and the NPS anticipates allowing the stream channel to restore the natural gradient.**

p. 18, Alternatives Considered, Alternative B: Preferred Alternative, The Rose Creek Bridge. A cast-in-place concrete deck would be poured and the railing and wing walls would be faced with ashlar or rubble stone, making the appearance of the new bridge ~~would~~ more compatible with the historic design characteristics of the Going-to-the-Sun Road.

p. 22, Alternatives, Suggestions, and Concerns Considered But Eliminated from Detailed Study. This section discusses one previously identified alternative, two dismissed methods for removing debris from the weir project area, ~~one~~ **two** dismissed methods for fracturing the weir, one dismissed method for accessing the weir, and suggestions from scoping that were considered but dismissed.

Fracture the weir with explosives. Using explosives to fracture the concrete weir was considered but dismissed in favor of expansive demolition grout **and or mechanical means** due to the higher overall hazards associated with explosives as well as noise considerations.

Fracture the weir with expansive demolition grout exclusively. Using expansive demolition grout exclusively to fracture the weir was considered but dismissed because it may not be sufficiently effective against reinforced concrete or in a wet, cold environment. This approach could also produce pieces of debris that are too large to haul out of the project area and which would therefore need to be further broken apart by some other means. If necessary and feasible, expansive demolition grout may be used in combination with other methods, such as breaking the structure apart mechanically.

p. 24, Alternative Summaries, Table 1, Summary of alternatives and how each alternative meets project objectives.

Alternative Elements	Alternative A – No Action	Alternative B – Remove the Weir and Replace the Bridge
The weir on Rose Creek	The abandoned weir on lower Rose Creek would not be removed.	The weir would be fractured with expansive demolition grout and or mechanical means ; large pieces would be removed by an excavator or similar equipment and specialized saws and or other tools would cut the rebar and reinforcing steel.

p. 25, Alternative Summaries, Table 2, Environmental Impact by Summary.

Impact Topic	Alternative A – No Action	Alternative B – Preferred
Water Resources	Negligible to minor Minor adverse, site-specific, and long-term from unabated sediment scouring and stream channel degradation.	Minor to moderate adverse, site-specific, and short-term from a temporary release of upstream sediments, limited use of heavy equipment in the stream channel, and recontouring of the stream bed. Minor long-term, site-specific, beneficial impacts from restoration of more natural sediment transport regime.

p. 37, Affected Environment and Environmental Consequences, Fisheries/Aquatic Threatened Species and Species of Concern, Impacts Analysis of Alternative B – Preferred. Implementing the project in September **late summer and fall** when stream flows are lowest would minimize negative impacts. **Breaking the weir apart mechanically would release some concrete debris into the stream channel; the larger pieces would be removed but the finer debris would add to increased turbidity during the first sedimentation pulse.**

p. 38, Affected Environment and Environmental Consequences, Fisheries/Aquatic Threatened Species and Species of Concern, Impacts Analysis of Alternative B – Preferred, Conclusion. Fracturing the weir with **mechanical means or in combination with expansive demolition grout would temporarily increase turbidity during the first sedimentation pulse.** Using expansive demolition grout **alone** would likely have no adverse effects on fisheries. Turbidity and habitat disturbances during implementation of the preferred alternative **and during high water the following spring** would have short-term, site-specific, negligible to minor adverse impacts to fisheries, including bull trout.

p. 40, Affected Environment and Environmental Consequences, Water Resources, Impacts Analysis of Alternative B – Preferred. **Removing the weir would release an initial pulse of sedimentation into the stream channel, and another pulse would be likely during high water the following spring; sedimentation pulses would be expected to clear up fairly quickly. Breaking the weir apart mechanically would release some concrete debris into the stream channel. The majority of this debris would be removed, especially the larger pieces, but the finer debris would contribute to increased turbidity during the first sedimentation pulse. Fracturing the weir with an If expansive demolition grout is used, the cracking agent itself is not likely to have any adverse effects on water quality.**

p. 40, Affected Environment and Environmental Consequences, Water Resources, Impacts Analysis of Alternative B – Preferred, Conclusion. **Fracturing Demolishing and removing the weir with mechanical means or in combination with expansive demolition grout would temporarily increase turbidity in the stream channel during sedimentation pulses. The constituents of the demolition grout would likely have no adverse effects on water quality.**

p. 55. Consultants.

Dan Jacobs, Park Trails Supervisor, Glacier National Park
Corey Shea, Westside Trails Foreman, Glacier National Park
Glen Smith, P. E., Park Engineer, Glacier National Park
Del Zimmerli, Facility Manager, Glacier National Park

p. 69. Statement of Findings for Floodplains, References. _____ National Park Service (NPS).
2003. Director's Order 77-2. Floodplain Management. Washington D.C

RESPONSE TO COMMENTS

Responses are in bold italics.

1. **COMMENT:** Benefits to bull trout and westslope cutthroat trout will be minimal because brook and Yellowstone cutthroat trout are already present in the system. Any improvements are nonetheless welcome.

RESPONSE: *We believe the actions, especially removing the weir, will have moderate beneficial impacts on bull trout because the increased habitat availability will provide an opportunity for bull trout to colonize areas upstream of the weir and establish a reproducing population. The impacts to bull trout are discussed on pp. 36-38 of the EA.*

2. **COMMENT:** The new bridge is described as a "clear span" having no part of it in the stream channel yet it is stated that rip rap around the abutments may be needed. It is not clear why rip rap would be needed if the abutments are not in the stream channel.

RESPONSE: *The natural instability and lateral movements of the stream channel could cause erosion of the stream banks at the bridge. While the abutments would be outside the stream channel, the substrate in which they are set could eventually become destabilized by continuous stream bank erosion. Rip rap is therefore necessary to armor and protect the stream banks.*

3. **COMMENT:** In the section "Impact Topics Dismissed from Further Analysis", wildlife in general is discussed as having minor to negligible impacts and dismissed. Yet in the description of the Preferred Alternative a list of wildlife mitigation measures is given. This does not appear consistent with the earlier dismissal of wildlife concerns if mitigation measures are appropriate. Other subjects addressed in the EA also have minor to negligible impacts so there doesn't seem to be justification for excluding wildlife concerns from analysis.

RESPONSE: *The Impact Topics Dismissed from Further Analysis section of the EA does not dismiss "concerns" related to the impacts to wildlife. Rather, this section dismisses the topic from the same level of analysis that is given to topics that are retained. Impact levels for both analyzed and dismissed topics are assessed under the assumption that the mitigation measures will be implemented; the negligible to minor impact determination for wildlife is therefore due in part to the mitigation measures developed for wildlife. At the beginning of the environmental process, NPS resource specialists determined which resources would be retained for analysis. Those resources that will be directly manipulated by the project (such as floodplains, water resources, vegetation, soils, and historic structures) or impacted to a degree exceeding minor (such as bull trout and water resources) were retained. Furthermore, in accordance with CEQ*

regulations at 1500.1(b), dismissing impact topics from further evaluation if the impacts are determined to be minor or less helps concentrate the EA on "issues that are truly significant to the action in question, rather than amassing needless detail".

4. **COMMENT:** Fish and sediment sampling before and after the project is sound management and should continue for longer than the 5 years proposed in the EA.

RESPONSE: *Sampling for five years is a reasonable time-horizon for initial monitoring efforts. Longer term, periodic sampling may be conducted depending on the results of the initial monitoring efforts.*

5. **COMMENT:** It would be helpful if the EA addressed current bat use of the existing bridge, if any, and the design of the bat boxes to be installed.

RESPONSE: *On p. 12, under Impact Topics Dismissed from Further Analysis, Species of Concern, the EA states that "...neither the Rose Creek weir nor the bridge as designed is habitable by bats...". Bats are unable to utilize the existing bridge due to the absence of crevices and other features that provide roosting sites. A number of different bat box designs are under consideration, and a single design has not yet been selected. At this time, at least two and possibly three different sized boxes will likely be used to accommodate different bat species with different preferences for crevice size.*

6. **COMMENT:** In the Statement of Findings for Floodplains, the NPS reference needs to be corrected.

RESPONSE: *Thank you for pointing this out; please see Text Changes above for the corrected reference.*

Appendix – Non-Impairment Finding

National Park Service's *Management Policies* 2006 require analysis of potential effects to determine whether or not actions would impair park resources. The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. National Park Service managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adversely impacting park resources and values.

However, the laws do give the National Park Service the management discretion to allow adverse impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the National Park Service the management discretion to allow certain impacts within parks, that discretion is limited by the statutory requirement that the National Park Service must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible National Park Service manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. An impact to any park resource or value may, but does not necessarily, constitute an impairment. An impact would be more likely to constitute an impairment to the extent that it affects a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- key to the natural or cultural integrity of the park; or
- identified as a goal in the park's general management plan or other relevant NPS planning documents.

An impact would be less likely to constitute an impairment if it is an unavoidable result of an action necessary to pursue or restore the integrity of park resources or values and it cannot be further mitigated.

The park resources and values that are subject to the no-impairment standard include:

- the park's scenery, natural and historic objects, and wildlife, and the processes and conditions that sustain them, including, to the extent present in the park: the ecological, biological, and physical processes that created the park and continue to act upon it; scenic features; natural visibility, both in daytime and at night; natural landscapes; natural soundscapes and smells; water and air resources; soils; geological resources; paleontological resources; archeological resources; cultural landscapes; ethnographic resources; historic and prehistoric sites, structures, and objects; museum collections; and native plants and animals;
- appropriate opportunities to experience enjoyment of the above resources, to the extent that can be done without impairing them;
- the park's role in contributing to the national dignity, the high public value and integrity, and the superlative environmental quality of the national park system, and the benefit and inspiration provided to the American people by the national park system; and
- any additional attributes encompassed by the specific values and purposes for which the

park was established.

Impairment may result from National Park Service activities in managing the park, visitor activities, or activities undertaken by concessioners, contractors, and others operating in the park. The NPS's threshold for considering whether there could be impairment is based on whether an action will have significant effects.

Impairment findings are not necessary for visitor use and experience, socioeconomics, public health and safety, environmental justice, land use, and park operations, because impairment findings relate back to park resources and values, and these impact areas are not generally considered park resources or values according to the Organic Act, and cannot be impaired in the same way that an action can impair park resources and values. After dismissing the above topics, topics remaining to be evaluated for impairment include fisheries and aquatic threatened species and species of concern, water resources, floodplains, vegetation, soils, and historic structures and cultural landscapes.

Fundamental resources and values for Glacier National Park are identified in the 1999 *General Management Plan*. According to that document, all of the impact topics carried forward in this EA are necessary to fulfill specific purposes identified in the establishing legislation of the park; are key to the natural or cultural integrity of the park; and/or are identified as a goal in the park's *General Management Plan* or other relevant NPS planning document.

- **Fisheries/Aquatic Threatened Species and Species of Concern.** Glacier National Park was established to protect natural and cultural resources. Short-term turbidity and habitat disturbances during implementation of this project will temporarily affect fisheries and aquatic threatened species and species of concern, resulting in negligible to minor adverse impacts. Although fisheries and aquatic threatened species and species of concern are a fundamental resource at the park, the preferred alternative will only result in negligible to minor, short-term, site-specific adverse impacts to fisheries and aquatic threatened species and species of concern; therefore, there will be no impairment to fisheries and aquatic threatened species and species of concern.
- **Water Resources.** A temporary release of upstream sediments, recontouring the stream bed, and limited use of heavy equipment in the stream channel during project implementation will have temporary minor to moderate adverse impacts to water resources. Although water resources are a fundamental resource at the park, the preferred alternative will only result in minor to moderate, short-term, site-specific adverse impacts to water resources; therefore, there will be no impairment to water resources.
- **Floodplains.** Abutments for the new bridge will displace some water during flood flows over a short distance of the stream, and there will be some temporary disturbances to floodplains during project implementation, resulting in negligible adverse impacts to floodplains. Although floodplains are a fundamental resource at the park, the preferred alternative will only result in negligible, short and long-term, site-specific adverse impacts to floodplains; therefore, there will be no impairment to floodplains.
- **Vegetation.** The project will cause the loss of some individual plants and will temporarily disturb and compact vegetation within the project area, resulting in minor adverse impacts to vegetation. Although vegetation is a fundamental resource at the park, the preferred alternative will only result in minor, short-term, site-specific adverse impacts to vegetation; therefore, there will be no impairment to vegetation.
- **Soils.** Temporary degradation, compaction, and disturbance during implementation of

the project will result in minor adverse impacts to soils. Although soils are a fundamental resource at the park, the preferred alternative will only result in minor, short-term, site-specific adverse impacts to soils; therefore, there will be no impairment to soils.

- **Historic Structures and Cultural Landscapes.** The replacement of the Rose Creek Bridge will have minor beneficial impacts to the Rose Creek Auto Camp Historic District, the Rising Sun Campground Campender's Cabin, and the Going-to-the-Sun Road, a National Historic Landmark. Because the preferred alternative will result in only minor beneficial, long-term, site-specific and local impacts to historic structures and cultural landscapes, there will be no impairment to historic structures and cultural landscapes.

In conclusion, as guided by this analysis, good science and scholarship, advice from subject matter experts and others who have relevant knowledge and experience, and the results of public involvement activities, it is the Superintendent's professional judgment that there will be no impairment of park resources and values from implementation of the preferred alternative.

National Park Service
U.S. Department of the Interior

Glacier National Park
Waterton-Glacier International Peace Park
Montana



STATEMENT OF FINDINGS FOR FLOODPLAINS

Rose Creek Bridge Replacement

Glacier National Park, Montana

Recommended: Kym A. Dale
ACTING FOR Chas Cartwright
Superintendent, Glacier National Park

4/10/12
Date

Concurred: Gary W. Rosenlieb
~~Bill Jackson~~ Gary Rosenlieb
acting Chief, Water Resources Division

04/17/12
Date

Approved: John Wessels
for John Wessels
Intermountain Regional Director
National Park Service

5/4/12
Date

INTRODUCTION

Glacier National Park (GNP) has prepared and made available an Environmental Assessment (EA) analyzing alternatives for replacing a bridge on lower Rose Creek, located below the Rising Sun developed area along the Going-to-the-Sun Road (GTSR) (Figure 1). The EA also assesses a proposal to remove a weir on Rose Creek upstream of the Rising Sun developed area. Removing the weir would not adversely affect floodplains, and the action to remove the weir is therefore not further discussed in this Statement of Findings.

The Rose Creek Bridge presents a barrier to fish passage, as the bridge's piers are connected by a solid concrete sill that spans the width of the stream. Water passes over the sill in a sheet flow, making upstream passage for fish difficult and causing the removal of sediments, or scouring, on the downstream side (Figure 2). The mid-channel piers have altered sediment transport through the reach and caused channel aggradation upstream of the structure. During periods of low flow in the summer and fall, a drop created by sediment scouring on the downstream side of the sill is approximately 2-3 feet high and likely prevents fish from migrating upstream. Sediment scouring and degradation of the natural stream channel have begun to undermine the bridge's long-term structural stability. The abutments are showing signs of settling, and maintenance will increase as the concrete ages. The bridge's span is also too narrow to accommodate small shifts in the stream channel over time.

Additionally, the appearance of the bridge is not compatible with the historic design characteristics of original structures and other features along the GTSR, a notable National Historic Landmark. The original 1932 bridge was severely damaged by a flood in 1964. When it was rebuilt the same year, the original rubble stone wing walls and railing were replaced with concrete and steel tube railing. This blend of contemporary materials with earlier features does not clearly represent historic design principles of either era, and the bridge is the only large structure along the GTSR that is not in keeping with the road's historic design characteristics.

The NPS is proposing to replace the existing Rose Creek Bridge with a new, approximately 85 foot-long clear span bridge. Replacing the bridge would remove a seasonal barrier to fish passage and improve stream flow and sediment transport. The appearance of the new bridge would be more compatible with the historic design characteristics of the GTSR.

Executive Order 11988 ("Floodplain Management") requires the 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.



National Park Service
U.S. Department of the Interior
Glacier National Park
Montana

Rose Creek Fish Barrier Removal and Bridge Replacement Environmental Assessment Rose Creek Bridge Site

October 2011

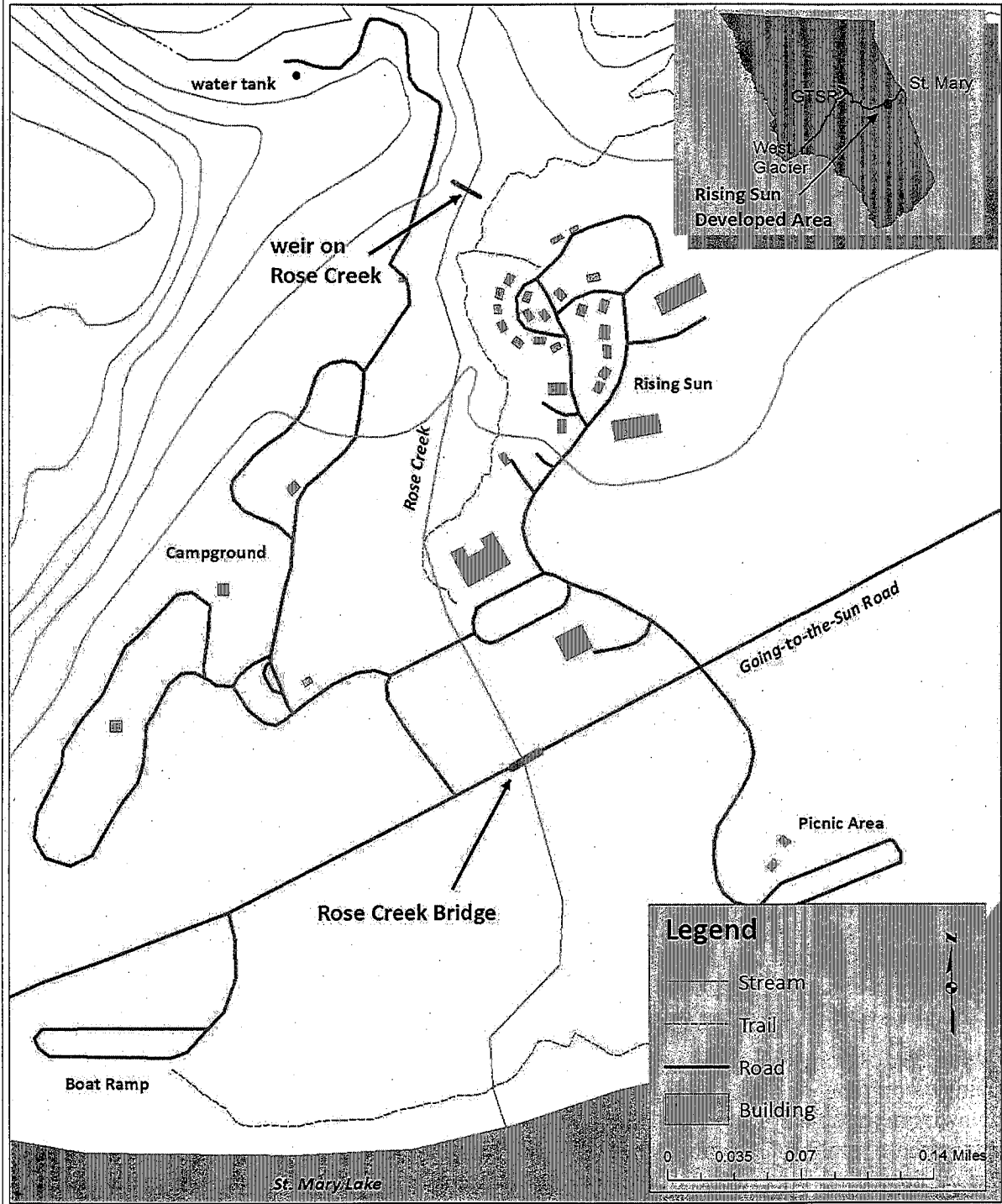


Figure 1: Rose Creek Bridge project area, Glacier National Park, Montana.

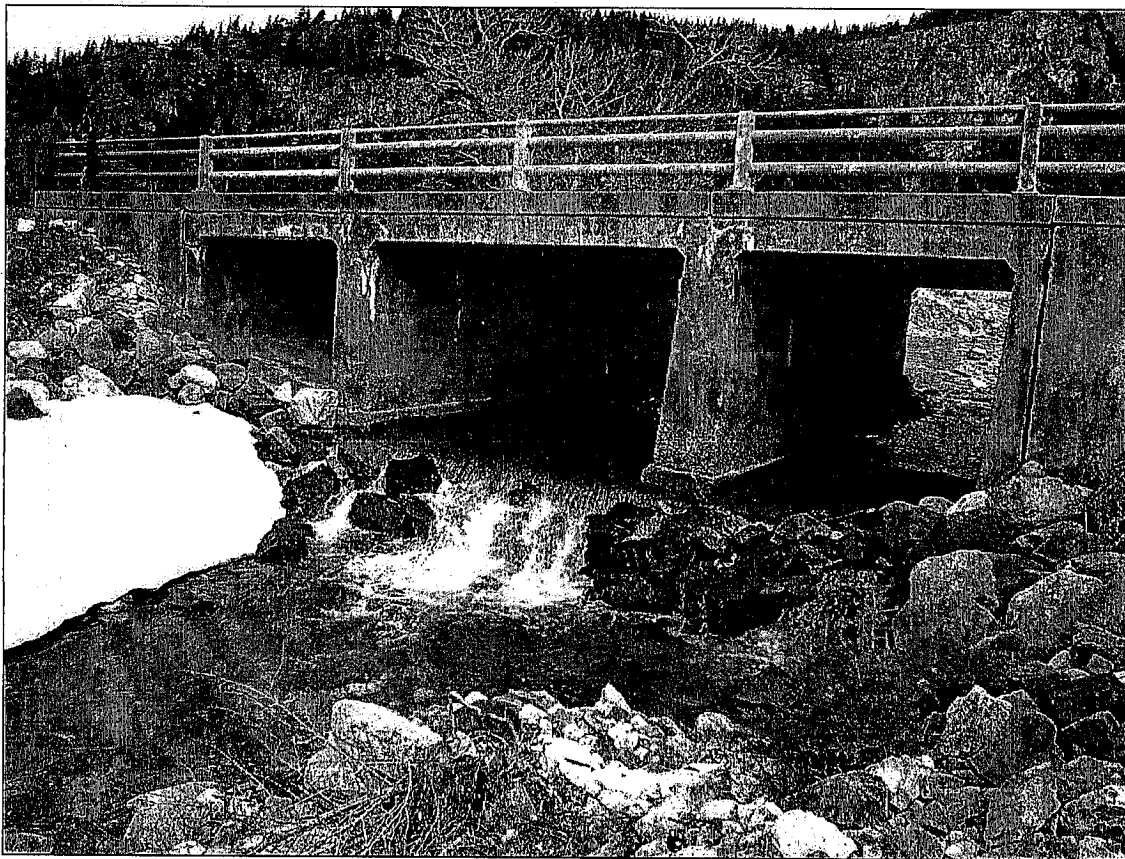


Figure 2: Rose Creek Bridge, Glacier National Park, Montana.

PROPOSED ACTION

Under the proposed action, the Rose Creek Bridge would be replaced with a new, approximately 85 foot-long, clear span bridge (Figures 3 and 4). The existing bridge would be demolished and all concrete and reinforcing steel would be removed and hauled to a disposal site outside the park. The existing girders may be removed without the need for work crews or equipment to access the creek, but some in-stream work involving hand-tools and an excavator would be required to cut the piers and concrete sill into manageable pieces and remove them. The stream may be temporarily diverted as necessary during demolition and removal of the concrete sill, and some native material may be excavated. Once the piers and sill are removed, the stream channel may be graded as necessary through the project area to match upstream and downstream elevations, and shaped to match adjacent existing conditions.

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 occur well away from the stream. Riprap would likely be required to armor and protect the abutments. An approximate total of 1200 cubic yards of native material above the ordinary high water mark and 210 cubic yards of native material below the ordinary high water mark would likely be excavated. Recontouring the banks for riprap and placing the material may require equipment within the stream channel. Demolition of the bridge would begin in mid to late September, when stream flows are low; construction of the abutments and installation of the new girders could extend through December.

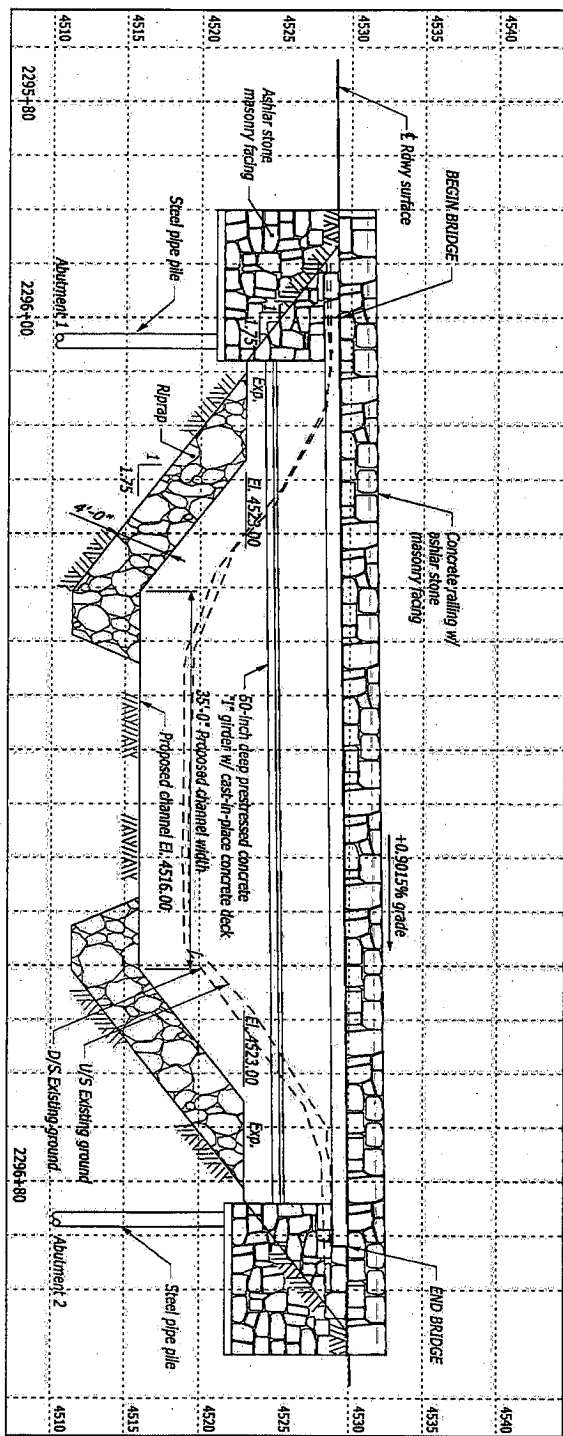


Figure 3: Preliminary design layout for the new Rose Creek Bridge; typical bridge section depicting elevations.

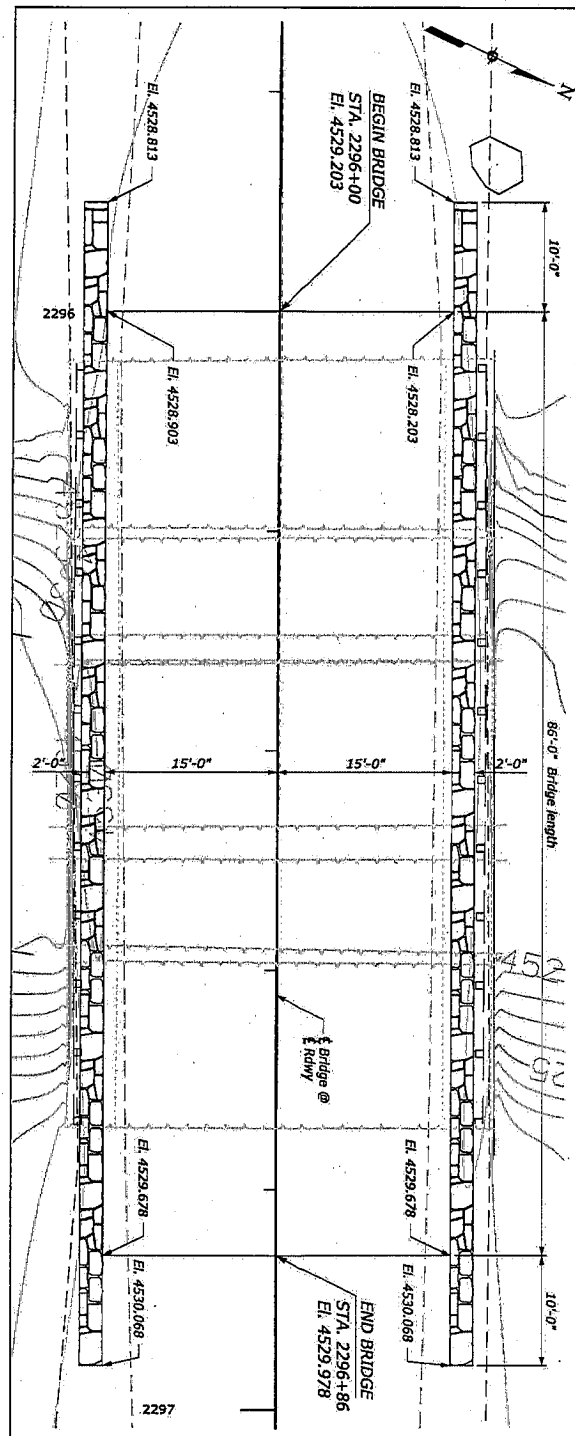


Figure 4: Preliminary design layout for the new Rose Creek Bridge; grade diagram.

SITE DESCRIPTION

Physical Setting

The project area is located in the Rose Creek drainage in Glacier National Park. Rose Creek arises from Otokomi Lake in the St. Mary River drainage on the east side of the park at an elevation of 6,482 foot (1,976 m) elevation, and flows 5.5 miles (8.9 km) before entering St. Mary Lake near Rising Sun campground at an elevation of 4,484 feet (1,367 m). The landform composition of the drainage consists of dissected mountain slope, moderately steep mountain slope, mountain upland and ridges, floodplain landforms, glacial lakes and deposits. Most of the 5,090 acre (2,060 ha) Rose Creek drainage is in recommended wilderness, with the lower portion flowing past the Rising Sun developed area and passing beneath the Rose Creek Bridge along the GTSR.

Upstream of Rising Sun (in the general vicinity of the weir), Rose Creek is formed in a narrow, structurally controlled valley type. The channel is characterized as a moderate to highly entrenched, boulder dominated, riffle-pool stream type. Frequent steps formed by bedrock inclusions and boulder aggregates characterize the reach (River Design Group 2009). Further downstream of the weir, Rose Creek exhibits pool-riffle morphology and is characterized by larger cobble and gravel substrate with frequent boulder inclusions that provide the pool formative structure in the reach. The channel is formed in a glacially scoured valley type with soils derived from moraines and deposited alluvium. Deep, coarse glacial till brackets the channel and is highly erodible due to the dynamic nature of the channel that precludes the establishment of a mature riparian corridor. Bank erosion and avulsive processes are active downstream and contribute fine and coarse sediment to the channel system (River Design Group 2009).

Hydrology

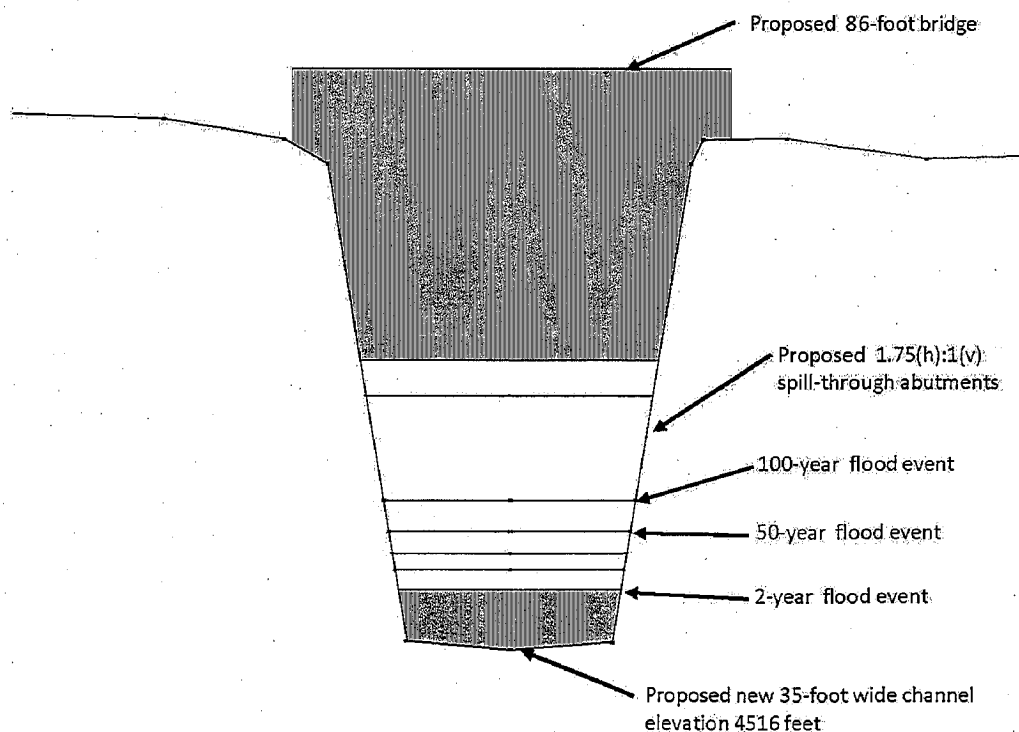
Rose Creek flows in a southeasterly direction from its headwaters, cascading over waterfalls and through boulder and bedrock chutes before opening into a broad alluvial floodplain. Rose Creek is fairly unstable in this reach, with unstable banks eroding into alluvial terraces, and large volumes of stored coarse sediment. The total annual sediment load derived from streambanks in the alluvial terrace zone in the lower reaches of Rose Creek has been estimated at 101 cubic yards (River Design Group 2009). Snowmelt, snowmelt charged groundwater, rainfall, and springs are the primary components of the stream flow in the drainage, and water quality would be described as pristine. Rose Creek experiences appropriate peak and base flows, similar to an undisturbed watershed of similar size in a similar geology and geography. Downstream of the project site, erosion/instability is evident where the stream channel cuts into adjacent terraces. Some of this is related to disturbance caused by attempts to reduce flood risk and keep the stream flowing under the existing bridges, but some degree of instability would be natural as the stream cuts through unconsolidated alluvial and glacial till. Some riprap has also been placed to stabilize lateral movements of the channel. Upstream of the Rising Sun developed area, Rose Creek has appropriate access to its floodplain. At Rising Sun and downstream of the developed area, the creek has incised and has limited ability to interact with its floodplain. Flood and erosion control measures have also impacted the ability of the creek to access its floodplain or develop a new floodplain at a lower base level.

JUSTIFICATION FOR USE OF THE FLOODPLAIN

By nature of the intent of the project (restore fish passage and improve sediment transport beneath an existing bridge, and address the bridge's structural concerns and incompatible historic design elements), the new bridge must be located in the floodplain. The abutments themselves would have negligible impacts on floodplain function because the channel has downcut in the project reach and already has little opportunity to interact directly with its floodplain. At most, the abutments would occupy the floodplain and displace some water during flood flows over a very short distance of the stream. In addition, development on both sides of the channel limits the stream's ability to access its floodplain.

HECRAS Model Output for Rose Creek Bridge - Proposed Conditions.

Flow Recurrence Interval	Discharge (cfs)	Water Surface Elevation (ft)	Average Channel Velocity (fps)	Maximum Channel Velocity (fps)
2-year	280	4519.7	4.4	5.9
50-year	845	4521.1	6.8	8.4
100-year	1210	4521.7	7.9	9.3



HECRAS modeled cross section immediately upstream of proposed bridge.

INVESTIGATION OF ALTERNATIVE SITES

There are no alternative locations for the new Rose Creek Bridge. The GTSR crosses Rose Creek at the Rising Sun Campground and developed area and has done so since 1932. There are no alternative locations that would avoid having to cross Rose Creek.

SITE-SPECIFIC FLOOD RISK

Flood boundaries along lower Rose Creek are not easily determined, but there is a potential 100-year floodplain south of the GTSR and another floodplain north of the road where the creek passes through the Rising Sun developed area (NPS 2004). The 1964 flood nearly destroyed the historic bridge, and a flood in 1995 washed away soils and vegetation restored following rehabilitation work on the GTSR. Flooding could occur frequently in the area, but there would be enough time to issue a flood warning and evacuate people to safe areas should the need arise (NPS 2004). An Evacuation Plan for the area is in place and recently updated April 28, 2011.

MITIGATION

Replacing the existing bridge with a new clear span bridge would mitigate existing adverse impacts to flood flows from developments along lower Rose Creek. The removal of the concrete sill between the existing bridge's piers would remove some restrictions to flood flows and improve flood flow capacity. The new bridge has been designed for structural durability and minimal resource impacts. The new bridge would be longer than the existing bridge, and the abutments would be located well away from stream flows.

Work would be completed during the fall at low flow periods, and any disturbances to floodplain soils during project implementation would be remediated by spring flows.

SUMMARY

The preferred alternative was designed to achieve project objectives while considering the floodplain values of the area. The proposed action would remove an obstacle to flood flows by replacing the existing Rose Creek Bridge with a new clear span bridge. The project would have negligible impacts on floodplain function because the channel has downcut in the project reach and already has little opportunity to interact directly with its floodplain. Due to the nature of the project (restore fish passage and improve sediment transport, and address structural concerns, the GTSR's status as a National Historic Landmark and incompatible historic design elements of the existing Rose Creek Bridge), 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

Dutton, B. L., J. Hadlock, M. Arthur, D. Marrett, A. Goldin, and A. Zhu. 2001. Soils of Glacier National Park. Land and Water Consulting, Inc., Missoula, MT.

_____. 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 Glacier, MT.

River Design Group. 2009. Technical memorandum on removal of Rose Creek Diversion Dam. Prepared for the National Park Service by River Design Group.

