Sequoia and Kings Canyon National Parks

National Park Service
U.S. Department of the Interior

Environmental Assessment

Replacement of the Cedar Grove Bridge, Kings Canyon

October 2009

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ENVIRONMENTAL ASSESSMENT
Cedar Grove Bridge

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National Park Service

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Sequoia and Kings Canyon
National Parks
California

U.S. Department of the Interior
National Park Service

Environmental Assessment
Cedar Grove Bridge Replacement

Sequoia and Kings Canyon National Parks
Fresno County, California

Summary

The National Park Service (NPS) in cooperation with the Federal Highway Administration/Central Federal Lands Highway Division (FHWA) is proposing to replace the 142-foot bridge spanning the South Fork of the Kings River at Cedar Grove Village in Sequoia and Kings Canyon National Parks (parks), Fresno County, California.

This environmental assessment evaluates two alternatives, including alternative A, the no action alternative. Alternative B, the management preferred alternative, includes the replacement of the existing 142-foot bridge with a new 280-foot bridge in the same location. The bridge would have steel girders placed on concrete bridge abutments and two concrete piers, and steel handrails with stone masonry pillars. The bridge would have a concrete deck to accommodate two 11-foot travel lanes and a sidewalk with a curb on the south side. Both roadway approaches would also be reconstructed.

The management preferred alternative would result in the restoration of the local reach of the South Fork of the Kings River, which is classified as a recreational river, according to the Wild and Scenic Rivers Act. The current bridge length is inadequate and restricts the flow area of the river, particularly during high water and flood events. This has resulted in sediment deposition and erosion upstream of the bridge, altering the natural river channel and fluvial processes. Occasional maintenance and repairs, including bank hardening and the placement of rip rap, has been necessary to protect the bridge. Lengthening the bridge and removing the hardened materials from the embankment should reduce constriction and improve the natural processes in this segment of the river.

Notes to Reviewers and Respondents

If you wish to comment on the environmental assessment, you may mail comments to the name and address below or post comments online at http://parkplanning.nps.gov/seki. This environmental assessment will be on public review for 30 days. Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment – including your personal identifying information – may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we would be able to do so. We would make all submissions from organizations, businesses, and from individuals identifying themselves as representatives or

officials of organizations or businesses available for public inspection in their entirety.

Please address comments to: Superintendent; Sequoia National Park; Attn: Cedar Grove Bridge; Sequoia and Kings Canyon National Parks; 47050 Generals Highway, Three Rivers, CA 93271. E-mail: SEKI_planning@nps.gov.

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ACRONYMS AND ABBREVIATIONS

AASHTO	American Association of State and Transportation Officials
ACHP	Advisory Council on Historic Preservation
AQI	Air Quality Index
BMPs	Best Management Practices
CCC	Civilian Conservation Corps
CEQ	Council on Environmental Quality
CDFG	California Department of Fish and Game
CFR	Code of Federal Regulations
DO-12	Director's Order 12
DSC	Denver Service Center
EA	Environmental Assessment
ESA	Endangered Species Act
ESF	Environmental Screening Form
FHWA	Federal Highway Administration
FGMP/EIS	Final General Management Plan and Comprehensive River Management Plan/Environmental Impact Statement
IDT	Interdisciplinary Team
IO	Isolated Occurrence
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act of 1990
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act
NOx	Nitrogen Oxides
NPS	National Park Service
NRHP	National Register of Historic Places
OHWM	Ordinary High Water Mark
ORV	Outstandingly Remarkable Value
PA	Programmatic Agreement
PM	Particulate Matter
RV	Recreational Vehicle
SHPO	State Historic Preservation Office
SJVAPCD	San Joaquin Valley Air Pollution Control District
USC	United States Code
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service

INTRODUCTION

The National Park Service (NPS) in cooperation with the Federal Highway Administration/Central Federal Lands Highway Division (FHWA) is proposing to replace the 142-foot-long bridge spanning the South Fork of the Kings River at Cedar Grove Village in Kings Canyon National Park (park), Fresno County, California (Figure 1).

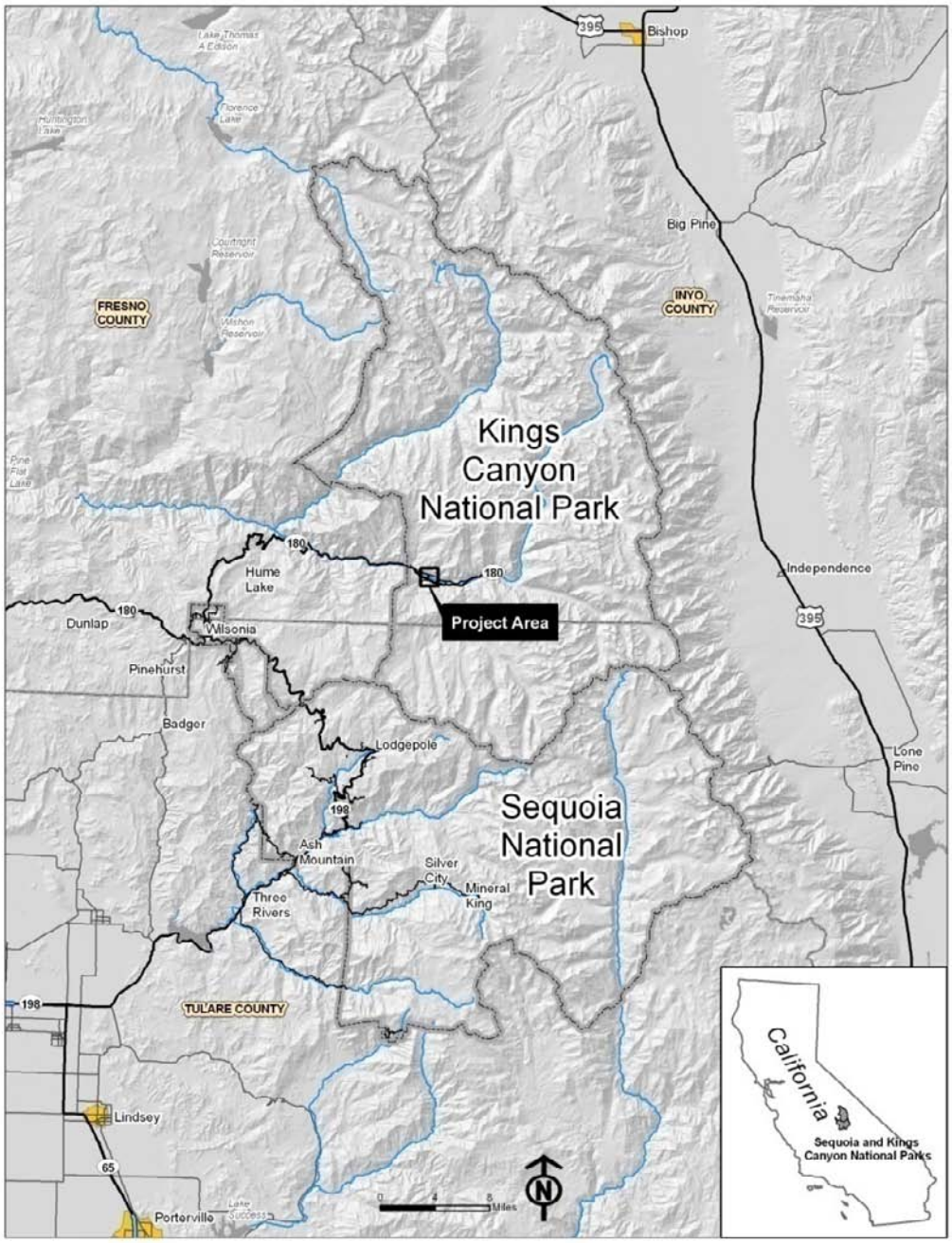


Figure 1. Sequoia and Kings Canyon National Parks including project area.

BACKGROUND

Kings Canyon National Park includes the detached Grant Grove and Cedar Grove areas. The Cedar Grove area is located in Kings Canyon (Figure 1), accessed by the Kings Canyon Scenic Byway, which starts on Highway 180 near Dunlap, travels through the park at Grant Grove, through the Giant Sequoia National Monument, then back into Kings Canyon National Park to Cedar Grove and Roads End. The road to the Cedar Grove area is open seasonally (generally late April through November).

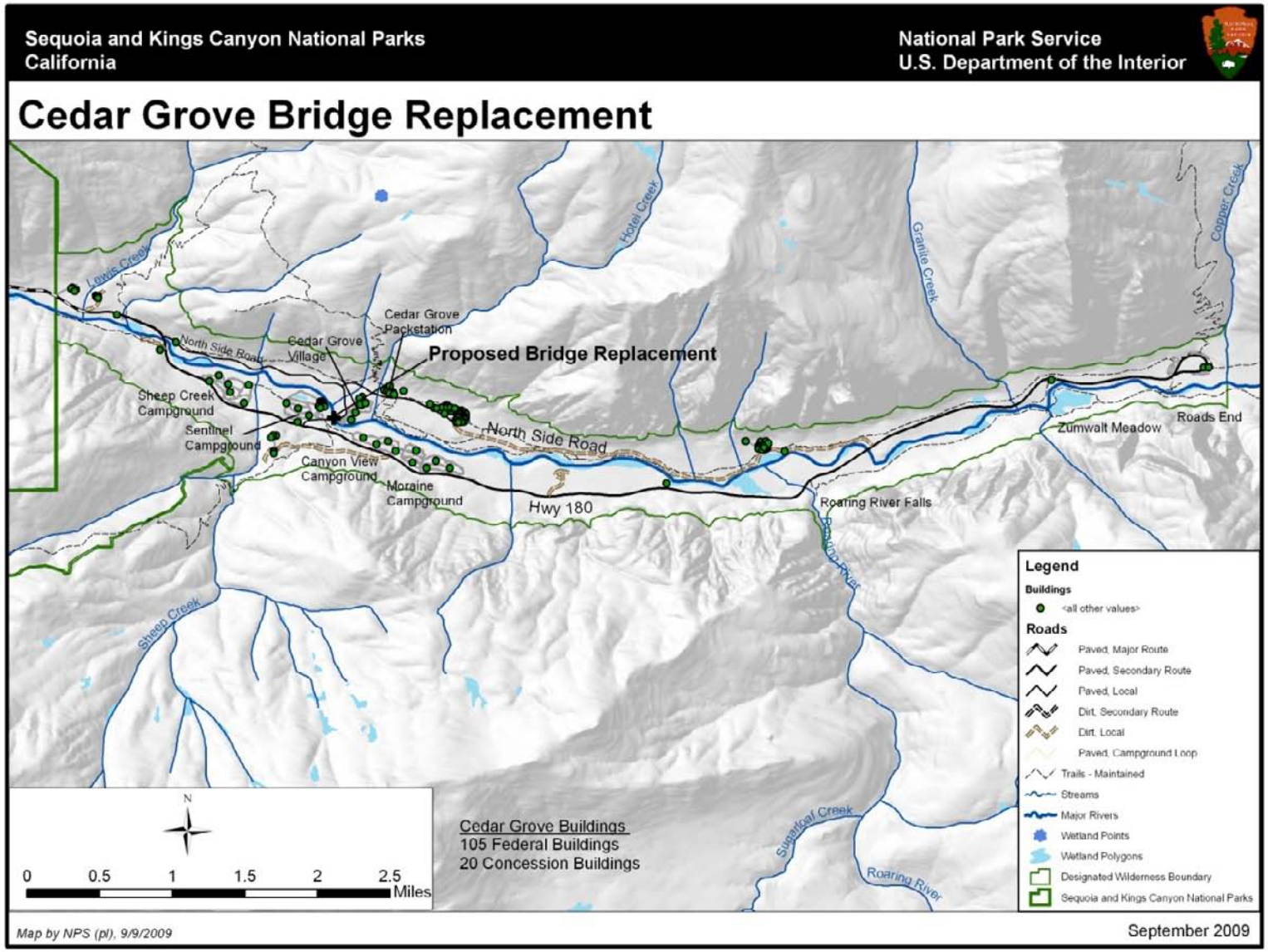
Kings Canyon is a glacially carved, deep canyon with waterfalls, lush meadows, campgrounds, and commercial facilities, and provides popular wilderness access. The developed area at Cedar Grove includes a NPS visitor center; park administrative, maintenance, and housing area; and NPS campgrounds, picnic areas, and trailheads. Concessioner-operated facilities include a lodge, gift shop, restaurant, administrative facilities, and packstation (generally open mid-May through mid-October). The road terminus is Roads End, where there is a wilderness permit station and access to several wilderness trailheads (Figure 2).

Six highway bridges exist in the South Fork of the Kings River portion of the park, including the Cedar Grove Bridge. The Cedar Grove Bridge was constructed in 1939. The bridge was designed to have a maximum load of 9 tons, but, due to degradation, its current capacity is 7 tons. The bridge has concrete abutments and one pier. Utilities, including fiberoptic, electrical, and telephone lines, and sewer and water connections to the Cedar Grove Lodge are located under the bridge. In addition, the pedestrian sidewalk across the bridge is degraded and needs to be repaired.

Cedar Grove has experienced at least nine large flood events in the past 70 years (1937, 1950, 1955, 1966, 1969, 1978, 1982, 1984, and 1997). Each of these floods covered the low floodplain terrace and reached a height predicted to occur in a 50-year flood event (NPS, Austin, pers. comm. 2008). In a 50-year flood event the level of floodwater is expected to be equaled or exceeded every 50 years on average. This is a flood that has a 2% chance of being equaled or exceeded in any single year (Dunne and Leopold 1978).

Prior to construction of the Cedar Grove Bridge, a 50-year flood event would be approximately 261 feet wide at this point, filling the entire channel from bank to bank up to an elevation of approximately 4,611 feet. To minimize the size of the bridge, earthen embankments were extended out into the river channel and armored with riprap. This narrowed the river’s floodway to approximately 137 feet, resulting in a significant constriction of flood flows. In addition, a pier was constructed in the middle of the channel, resulting in another structural impediment to free flow. The river carries many trees during 50-year flood events, some of which are quite large. These can become lodged against the pier, embankments or girders, further constricting the channel (NPS, Austin, pers. comm. 2008).

Figure 2. Project Location Map



The bridge has an adequate vertical opening to pass these floods; however, it does not have an adequate horizontal opening. The constriction created by the embankments and the pier has resulted in alterations of the stream channel under and immediately upstream from the bridge. For example, a new channel has formed in the river to the west of what was once a vegetated low floodplain terrace. Up to 4 vertical feet of that terrace has also been eroded beneath the bridge. A large cobble and sediment bar has formed in what was once the main channel on the right side of the river.

Maintaining and repairing the bridge has sometimes required in-stream manipulation of the river channel interfering with the free-flowing characteristics of the river. Fill and riprap material were required to repair damage done to the left embankment during the 1955 and 1997 floods (NPS, Austin, pers. comm. 2008).

PURPOSE AND NEED FOR ACTION

Purpose

In its current condition, the bridge does not provide a safe, durable, sustainable passage for vehicles at Cedar Grove, is unsafe for pedestrians and bicycles, and restricts the free-flowing character of the South Fork of the Kings River, particularly during high water and flood events.

The purpose of this project is to maintain and enhance access for visitors, park employees, and concessioners in the Cedar Grove area, in a safe and sustainable manner.

The second purpose of this project is to meet the mandates of the Wild and Scenic Rivers Act (16 U.S.C. 1271 et seq.). The 7.6-mile segment of the South Fork of the Kings River, including the project area, is a designated Wild and Scenic River, classified as a recreational river segment. In accordance with the Wild and Scenic Rivers Act, this area will be administered in such a manner as to protect and enhance the values that caused it to be included, without limiting other uses that do not substantially interfere with public use and enjoyment of these values. NPS *Management Policies* directs the parks to take no management actions that could adversely affect the values that qualify a river for the national wild and scenic rivers system (4.3.4) (NPS 2006).

The final purpose of this project is to implement a component of the approved FGMP/EIS for the parks. The FGMP/EIS calls for the replacement of the Cedar Grove Village Bridge to reduce impacts and increase sustainability (NPS 2007).The FGMP/EIS directs the parks to protect the free-flowing character of river areas and to maintain and enhance the integrated ecological functions, natural hydrological, and free-flowing condition of park rivers.

Photo 1. Existing Cedar Grove Bridge.

Need

The need for the action is to reconstruct the bridge in a manner that would improve sustainability and meet standard weight requirements, to continue to provide for visitor and park access, while protecting and enhancing the values of the Cedar Grove Bridge, in accordance with the *Wild and Scenic Rivers Act*, NPS policies, and park goals.

The objectives of this project are to:

- Provide safe vehicular, pedestrian, and bicycle access to Cedar Grove Village in a manner that lessens resource impacts and improves sustainability;
- Provide utilities to the Cedar Grove Village in a safe and sustainable manner;
- Improve the Kings River's ability to flow in a wild and natural course and better protect the river's ORVs;
- Protect other natural and cultural resources in the project area, including floodplains, riparian areas, and wetlands; and
- Protect park facilities downstream of the bridge.

LEGISLATION, RELATED PLANS, AND GUIDANCE

The NPS *Organic Act of 1916* (Organic Act) (16 U.S.C. 1, 2–4) and the *General Authorities Act* (16 USC 1a-8) direct the NPS to conserve the scenery, the natural and historic objects, and wildlife, and to provide for the enjoyment of those resources in such a manner as to leave them unimpaired for future generations. The *Redwood Act* (16 USC 1a-1) reaffirmed the mandates of the *Organic Act* and provided additional guidance on national park system management as follows:

The authorization of activities shall be construed and the protection, management, and administration of these areas shall be conducted in light of the high public value and integrity of the national park system and shall not be exercised in derogation of the values and purposes for which these various areas have been established (16 U.S.C. 1a-1).

The South Fork of the Kings River in the Cedar Grove area, which is included in the river segment consisting of the lower 7.6 miles within Kings Canyon National Park, is classified as a recreational river under the *Wild and Scenic Rivers Act* (16 U.S.C. 1271-1287). By law, the river is to be managed in such a way as to accommodate its free-flowing characteristics. This includes such management actions as:

- Protecting the river's outstandingly remarkable values (ORVs) of scenery, recreation, and geology. ORVs are defined as those resources that are river-related and rare, unique, or exemplary in a regional or national context;
- Accommodating the flow of the river during high water events, including the natural transport of water, sediment, and large woody material;
- Accommodating the natural tendency, if any, of the river to migrate during flood events;
- Protecting the river from potential sewer line failure due to a flood event;
- Ensuring the aesthetics of bridges blends into the river's spectacular natural surroundings;
- Minimizing the use of river hardening features such as riprap; and
- Minimizing the amount of in-stream manipulation of the river channel.

These and other laws and mandates were incorporated into the NPS *Management Policies* 2006 that provide guidance for management of all national park units.

Management Policies Section 9.2.1 states "park roads will be well constructed, sensitive to natural and cultural resources, reflect the highest principles of park design, and enhance the visitor experience." The 1984 NPS Park Roads Standards states that roads in national parks serve a distinctly different purpose from most other road and highway systems. Those of the national park system are distinguished by their unique natural, cultural, scenic, and recreational qualities. Park roads

are to be designed with extreme care and sensitivity to provide access for the protection, use, and enjoyment of the resources that constitute the national park system.

The FGMP/EIS (NPS 2007) provides the following direction relative to the Cedar Grove Area transportation infrastructure and the South Fork of the Kings River:

- Protect the free-flowing character of the river areas.
- Assess river, floodplain, wetland, and riparian areas — Maintain and enhance the integrated ecological functions to protect and enhance the natural hydrologic and free-flow condition of the river. As projects are proposed, assess necessity and impacts of all facilities within the 100-year floodplain.
- Replace Cedar Grove Village Bridge (and other bridges as needed), and consider alternative locations assessed for less resource impacts and improved sustainability.

PARK PURPOSE, SIGNIFICANCE, AND MISSION

An essential part of the planning process is to understand the purpose, significance, and mission of the park for which this environmental assessment (EA) is being prepared.

Park Purpose

Sequoia National Park was established as the nation's second national park on September 25, 1890, with the purpose of preserving the giant sequoias (*Sequoiadendron giganteum*) (26 Stat. L., 478). General Grant National Park was established a week later (26 Stat. L., 650), also with the purpose of preserving the giant sequoias. On July 3, 1926, Sequoia National Park was further enlarged (16 U.S.C. 688, 44 Stat. L., 821). Kings Canyon National Park was established by Congress in 1940 absorbing General Grant National Park (54 Stat. L., 41). On August 6, 1965, Cedar Grove and Tehipite Valley were added to Kings Canyon National Park (79 Stat L., 446, P.L. 89–111).

As defined by the various enabling legislations and reaffirmed through the FGMP/EIS, the following are the purposes of Sequoia and Kings Canyon National Parks:

- Protect forever the greater Sierran ecosystem — including the sequoia groves and high Sierra regions of the park — and its natural evolution.
- Provide appropriate opportunities to present and future generations to experience and understand park resources and values.
- Protect and preserve significant cultural resources.
- Champion the values of national parks and wilderness.

Park Significance

Park significance statements capture the essence of the national park's importance to the natural and cultural heritage of the United States of America. Significance statements do not inventory park resources; rather, they describe the park's distinctiveness and help place the park within the regional, national, and international context.

Sequoia and Kings Canyon national parks are special and unique places because they have:

- The largest giant sequoia trees and groves in the world, including the world's largest tree, the General Sherman Tree;
- An extraordinary continuum of ecosystems arrayed along the greatest vertical relief (1,370 to 14,497 feet elevation) of any protected area in the lower 48 states;
- The highest, most rugged portion of the high Sierra, which is part of the largest contiguous alpine environment in the lower 48 states;
- Magnificent, deep, glacially carved canyons, including Kings Canyon, Tehipite Valley, and Kern Canyon;
- The core of the largest area of contiguous designated wilderness in California, the second largest in the lower 48 states;
- The largest preserved southern Sierran foothills ecosystem;
- Almost 300 known marble caverns, many inhabited by cave wildlife that is found nowhere else; and
- A wide spectrum of prehistoric and historic sites documenting human adaptations in their historic settings throughout the Sierran environments.

The parks have been designated as an International Biosphere Reserve, a program under the United Nations Educational, Scientific, and Cultural Organization that recognizes resources with worldwide importance. While this designation does not grant any form of control or ownership to the international body, it underscores the exceptional and singular qualities of the parks.

Park Mission

Together, purpose and significance lead to a concise statement—the mission of the park. The mission of parks is based on the mission of the NPS, as defined by Congress in the *Organic Act*: to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations. Specifically, the mission of Sequoia and Kings Canyon national parks is to protect forever the greater Sierran ecosystem, including the sequoia groves and high Sierra regions of the parks and their natural evolution, and to provide appropriate opportunities to

present and future generations to experience and understand park resources and values.

ISSUES AND IMPACT TOPICS

Public Scoping

To begin the planning process, staff of the parks and resource professionals of the NPS Denver Service Center (DSC) and FHWA employees initiated internal scoping in a project review meeting in August 2004. Between 2004 and 2008, park, DSC, and FHWA staff conducted on-site and off-site meetings and discussed issues and options.

A press release (Appendix A) initiating public scoping and describing the proposed action was issued on December 16, 2008 and sent to 84 local, regional, and national newspapers, radio and television stations. The California State Historic Preservation Officer (SHPO) and American Indian groups traditionally associated with the parks were sent scoping letters (Appendices B and C) on December 15, 2008. In addition, notification of public scoping was sent to 273 agencies, individuals, businesses, and interest groups on the parks' mailing list. Comments were solicited until the scoping period ended January 19, 2009.

A total of five comments were received via e-mail, through the NPS Planning, Environment, and Public Comment (PEPC) website, and one by mail. Two commenters, including one interest group and one individual, supported the project and included a request to improve pedestrian and bicycle access on the bridge. One individual suggested an alternative to remove the existing bridge and improve the North Side Road, and similarly, one interest group suggested removing the bridge and replacing it with a pedestrian/bicycle bridge. One commenting agency requested more information on the project.

Internal and external scoping comments were considered in the choice of impact topics and were used in the development and evaluation of alternatives discussed in this EA. Table 1 discusses the impact topics, the reasons for retaining the topic, and the relevant laws, regulations, and policies.

Table 1. Impact topics retained for further evaluation and relevant laws, regulations, and policies.

Impact Topic	Reasons for Retaining Impact Topic	Relevant Laws, Regulations, and Policies
Water Quality	In-stream work would be necessary for replacement of the girders, riprap placement for abutment slope protection, and restoration work, resulting in adverse impacts on water quality. There could be beneficial effects resulting from decreased erosion of the river bank from river bank stabilization. Therefore, this topic will be further evaluated in the EA.	*Clean Water Act*; *Fish and Wildlife Coordination Act of 1934* (PL 85-624) as amended; Executive Order 12088; NPS *Management Policies,* NPS-77
Hydrology and Stream Flow Characteristics	Construction and river restoration work would impact hydrology and stream flow characteristics. There may be beneficial effects	*Clean Water Act*; *Fish and Wildlife Coordination Act of 1934* (PL 85-624) as amended; Executive Order

Impact Topic	Reasons for Retaining Impact Topic	Relevant Laws, Regulations, and Policies
	resulting from replacement of the existing bridge with a longer bridge. Therefore, this topic will be further evaluated in the EA.	12088; NPS *Management Policies,* NPS-77
Wild and Scenic Rivers, including geologic resources	The South Fork of the Kings River in the Cedar Grove area, which is included in the river segment consisting of the lower 7.6 miles within Kings Canyon National Park, is classified as a recreational river under the Wild and Scenic Rivers Act. Since this project will occur within the river corridor, this topic will be further analyzed in the EA and a Section 7 determination is included (Appendix D).	*Wild and Scenic Rivers Act*: NPS *Management Policies*
Floodplains	The project would occur within the floodplain of the South Fork Kings River, and could have both adverse and beneficial effects; therefore, this topic will be further evaluated in the EA and a Statement of Findings for Floodplains is included (Appendix E).	Executive Order 11988 Floodplain Management, Floodplain Management (DO-77-2)
Wetlands	Riverine wetlands are present at the project site and could be affected by bridge construction and river restoration work. Therefore, this topic will be further evaluated in the EA and best management practices are detailed in Appendix F.	Executive Order 11990 Protection of Wetlands, NPS *Management Policies* and Procedural Manual #77-1: Wetland Protection, *Clean Water Act* Sections 404 and 401
Vegetation and Non-Native Vegetation	The project would result in the removal of native vegetation and may increase the potential for the establishment of non-native vegetation; therefore, this topic will be further analyzed in the EA.	NPS *Organic Act*; NPS *Management Policies*; Resource Management Guidelines (NPS-77); *Federal Noxious Weed Control Act*; Executive Order 13112; Invasive Species (1999)
Wildlife and Fisheries	Noise and equipment use during the project could disturb wildlife. Some small and large animals could be displaced during project activities. Small mammals could be harmed or killed if their dens are destroyed during ground disturbing activities. Several trees containing nesting habitat would be removed. In-stream work could increase turbidity and affect fish and fish habitat. Therefore, this topic will be further analyzed in the EA.	NPS *Organic Act*; NPS *Management Policies*; Resource Management Guidelines (NPS-77)
Visitor Experience, Health and Safety	The project could disturb visitors during construction due to reduced access and noise from construction. The visitor experience could be affected. The bridge currently does not meet highway weight standards and is not universally accessible. The NPS must consider safe access for visitors and park staff, therefore, this topic will be further analyzed in the EA.	NPS *Management Policies*

IMPACT TOPICS DISMISSED FROM DETAILED ANALYSIS

Scoping issues or impact topics that were considered, but were not evaluated further, are discussed below.

Soils

Under the no action alternative, long-term, minor, adverse impacts on soils would continue, resulting from the erosion of the west bank of the South Fork of the Kings River upstream of the bridge. The management preferred alternative would impact approximately 0.4 acres of previously undisturbed soils. These impacts would result from construction activities that would occur outside the prism of the bridge approaches because of the deeper cut that would be needed on the west approach to the bridge to accommodate water and sewer from the Cedar Grove Lodge. The realignment of the multi-use trail would also result in minor impacts on soils. However, because the old trail segment would be restored and asphalt removed there would be no net loss of soils. Overall, adverse impacts on soils would be no greater than short-term and negligible to minor; therefore, soils were dismissed as an impact topic.

Air Quality and Climate Change

The 1977 amendment to the *Clean Air Act* (42 U.S.C. 7401 *et seq*.) requires federal land managers to protect park air quality. Sequoia and Kings Canyon National Parks were designated Class I under the 1970 *Clean Air Act*, as amended. A Class I area is subject to the most stringent regulations of any designation.

Further, the 1970 *Clean Air Act* provides the federal land manager (the Assistant Secretary for Fish and Wildlife and Parks and the Park Superintendent) with an affirmative responsibility to protect the parks' air quality related values (including visibility, plants, animals, soils, water quality, cultural and historic resources and objects, and visitor health) from adverse air pollution impacts. Section 118 of the 1970 *Clean Air Act* requires the parks to meet all federal, state, and local air pollution standards.

The proposed project falls within the San Joaquin Valley (SJV) Air Pollution Control District (Ratliff, et al. 2005). In 2006 the air district was classified as extreme non-attainment for ozone (1 hour) and serious non-attainment for particulate matter (PM10). This air district is susceptible to air pollution given its climate, topography, and human activities. Since then, the U.S. Environmental Protection Agency (EPA) has redesignated the San Joaquin Valley to attainment of the PM10 standard (San Joaquin Valley Air Pollution Control District 2008). Even though the ozone (1 hour) standard was revoked on June 15, 2005, the Valley has experienced an overall improvement in 1-hour ozone since 1997. Seventeen out of the 21 of the Valley's air monitoring sites, including the monitoring sites located in Sequoia and Kings Canyon National Parks, are in attainment of the 1-hour ozone National Ambient Air Quality Standards (NAAQS) (SJVAPCD 2008).

In an effort to reduce air pollution sources within the park, the park has formed a partnership with the EPA to collaborate on controlling greenhouse gases and climate change. This program is called the Climate Friendly Parks Program, which provides management tools and

resources to address climate change. As part of the Climate Friendly Parks Program the park has developed an action plan to reduce criteria air pollutants (CAPs) and greenhouse gases. The plan addresses reductions in transportation, energy, waste, and miscellaneous issues, including cleaning products, mechanical fluids, refrigeration, paint, etc. Transportation strategies described in the plan relative to the proposed project include improving vehicle efficiency and idling reduction (NPS 2008).

The bridge is located within a development zone of the park. Overall, there would be a slight and temporary degradation of local air quality due to dust and vehicle emissions and emissions from the operation of a concrete batch plant, and slight increases in greenhouse gas and CAP emissions generated from construction equipment during the project work. There would be a slight degradation of air quality along the Kings Canyon Scenic Byway resulting from the use of vehicles during mobilization and de-mobilization. Emissions from construction equipment and the use of a generator at the concrete batch plant during the proposed project could also contribute to increased emissions of CAPs and greenhouse gases.

The slight increase in particulate matter and emissions from this project would not exceed NAAQS for either of the pollutants of concern, ozone or PM 2.5. Other CAPs and greenhouse gases would increase slightly during the construction period, but this increase would be short-term and local and would not exceed air quality standards. Mitigation measures, such as dust control and idling restrictions, are proposed in the mitigation measures section to minimize impacts on air quality. Because the increase in CAPs and greenhouse gases would result in a local, short-term, negligible to minor, adverse impacts on air quality, and would result in no effect to climate change, this topic was dismissed from further evaluation.

Night Sky

The parks offer many opportunities to experience the night sky free from artificial light. The FGMP/EIS (2007a) states, “Efforts should be undertaken to ensure that light pollution from inside the parks does not erode this value.” Existing impacts on the night sky in the project area include light from vehicle headlights traveling on the area roads, and light generated by campground use and concession-operated facilities. These lights may degrade the night sky for visitors and residents in the parks after dusk. The extent of light pollution from headlights is limited by vegetation that buffers the roadway in many areas, and can be considered localized and negligible, lasting as long as it takes a vehicle to pass. The impact from lights in area campgrounds results from visitor use (no NPS lights are provided), and generally only lasts until campers retire for the night. The concessioner keeps several lights on through the night at the Cedar Grove Lodge for security and safety purposes; however these lights are directed down and generally only affect a localized area around the concessioner, and are buffered by large trees and vegetation. No additional permanent lighting is proposed under either

alternative so there would be no change from existing conditions. Therefore, night sky was dismissed as an impact topic.

Soundscapes

In accordance with NPS *Management Policies* and *Director's Order – 47: Soundscape Preservation and Noise Management*, an important part of the NPS mission is preservation of natural soundscapes associated with national park units. Natural soundscapes exist in the absence of human-caused sound. The natural ambient soundscape is the aggregate of all the natural sounds that occur in park units, together with the physical capacity for transmitting natural sounds. The frequencies, magnitudes, and durations of human-caused sound considered acceptable varies among NPS units, as well as throughout each park unit (developed area v. wilderness).

The bridge is located in a developed area with the normal frequency, magnitude, and duration of human-caused sounds associated with roads, campgrounds, concessions, and visitor use. Noise associated with bridge construction and the river restoration project would increase the frequency, magnitude, and duration of human-caused sounds during the construction period at the bridge site, staging areas, and batch plant site. These sounds would be limited to daylight hours with the exception of the transfer of water and sewer which may be done for a short period at night. Because the noise from construction and project activities would occur in a development zone where expectations of human-generated noise exist and would result in short-term, minor, adverse impacts, this impact topic was dismissed from further analysis.

Socioeconomics

The Cedar Grove Village is a concessioner-operated facility on the north bank of the Kings River. Facilities include a lodge, snack bar, laundry/shower, and packstation, along with concession offices and employee housing. These facilities are managed by private concessioners under contracts with the park and operate seasonally from mid-May to mid-October. The Cedar Grove Bridge provides access between NPS facilities, including area campgrounds, and the Cedar Grove Village.

Park concessions management staff have advised that the effects of the proposed project on concessioner sales receipts may be detectable, but would be small. There would be no reduction in employment in the project area because of the proposed project. Temporary removal of the bridge would be inconvenient, but visitors would continue to patronize the concessions by using the detour on the North Side Road.

Minimal employment opportunities and some related revenues for construction materials would be anticipated for the replacement of the Cedar Grove Bridge in a localized area. Overall, the proposed project is expected to have short-term, negligible to minor, adverse and beneficial impacts on the socioeconomic environment in a small, localized area. Therefore, socioeconomics was dismissed as an impact topic.

Energy Conservation

The management preferred alternative would require expenditures of energy, including natural and depletable resources during the construction period from construction equipment and visitors needing to use a longer route to reach the Cedar Grove Village. However, the use would be short-term and have negligible impacts on these energy resources. Neither of the alternatives analyzed in this EA would require an increase in energy consumption, nor would the alternatives have appreciable effects on energy availability or costs. Adverse impacts would be no greater than short-term and negligible. Therefore, this impact topic was dismissed from further analysis.

Park Operations

Various NPS facilities are located on the north side of the Cedar Grove Bridge, including maintenance facilities, the park housing area, and storage for emergency vehicles. These facilities can be accessed via the North Side Road during the detour. Increased traffic delays during construction and bridge closure and detours would have an adverse impact on the park staff's ability to respond to routine maintenance between the facilities on the north side of the river and the south side of the river. These adverse impacts would be temporary and negligible. Therefore, park operations were dismissed as an impact topic.

Special Status Species (Threatened and Endangered Species, Species of Concern, and Rare Plants)

The *Endangered Species Act of 1973* (ESA) (16 U.S.C. 1531-1544), as amended, requires an examination of impacts on all federally listed threatened or endangered species. Section 7 of the ESA directs all federal agencies to use their existing authorities to conserve threatened and endangered species and, in consultation with the USFWS, to ensure that their actions do not jeopardize listed species or destroy or adversely modify critical habitat. NPS policy requires examination of the impacts on federal candidate species, as well as state-listed threatened, endangered, candidate, rare, declining, and sensitive species.

Special Status Animal Species

In December 2008 the parks received the most current list of federally and state listed endangered and threatened animals and plants from the online databases at: http://www.dfg.ca.gov/hcpb/ species/lists.shtml/ and http://www.fws.gov (Appendix G). After review of the species lists along with available park data, it was determined that one federally listed wildlife species, California condor (*Gymnogyps californianus*) and two candidates for federal listing, the Pacific fisher (*Martes pennanti*) and the Sierra Madre yellow-legged frog (formerly mountain yellow-legged frog) (*Rana muscosa*) had suitable habitat in or proximate to the project area. In addition, the bald and golden eagle, species of concern, have suitable habitat near the project area.

Based on park records, the California condor and the Sierra Madre yellow-legged frog have been extirpated from the project area (Werner, pers. comm. 2009).

The Pacific fisher, a federal candidate species, inhabits logs and tree cavities, and has a highly variable diet including mammals, birds, carrion, and fruit. Pacific fishers tend to be rather shy and solitary, generally avoiding large open areas. Radio-tagged individuals have been known to occupy a home range of up to 75 square kilometers. Due to these habitat specifications, the Pacific fisher is generally limited to extensive tracts of relatively undisturbed, late-successional forest (Lewis and Stinson 1998). The Pacific fisher is a rare visitor to the project area, but generally avoids the area due to lack of habitat and the presence of humans and facilities.

The bald eagle and the golden eagle (*Aquila chrysaetos*) are protected by the *Bald and Golden Eagle Protection Act* (16 USC 668 a-d). The bald eagle is a transient visitor to the park and is unlikely to be in the project area more than momentarily. The golden eagle occurs throughout the park and may fly over the bridge site, but would likely avoid the area during construction and would not be affected by project activities.

After consulting internet sources and with park wildlife biologists, it was determined that there would be no effect on listed, candidate, or sensitive wildlife species or their habitat as a result of project activities, therefore, this topic was dismissed from further analysis.

Special Status Plant Species

Of over 1,500 species of vascular plants in the parks; no species are listed as federally threatened or endangered (Appendix G). An initial search for plants known to occur in the area was made using the California Native Plant Society Rare Plant Inventory (2006) database and the parks' database for Cedar Grove and Fresno County localities (Haultain, 2009).

After surveying the area, it was determined that no special status plant species are known to occur in the area. Therefore, special status plant species would not be impacted by the proposed project and this topic will not be further analyzed in the EA. However, it was also recommended by the parks' botanist that another plant survey be completed prior to construction.

Prime and Unique Farmland

In 1980 the Council on Environmental Quality (CEQ) directed federal agencies to assess the effects of their actions on farmland soils classified as prime or unique by the U.S. Department of Agriculture, Natural Resources Conservation Service. Prime or unique farmland is defined as soil which produces general crops such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts. As identified by park staff, there are no prime or unique farmlands associated with the project area. Therefore, this topic was dismissed from detailed analysis.

Environmental Justice

Executive Order 12898 (General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations 1994) requires all 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 or communities. No alternative under consideration would have disproportionate impacts on the health or environment of minority or low-income populations or communities as defined in the 1996 EPA's Draft Environmental Justice Implementation Plan. The alternatives would affect all populations equally; therefore, environmental justice was dismissed from detailed analysis.

Wilderness

The Cedar Grove area is a frontcountry zone and development zone. The road corridor is a high use scenic driving zone (NPS 2007). The proposed project is located outside of wilderness and would not affect wilderness resources or character. Therefore, wilderness was dismissed as an impact topic.

Historic Structures

The *National Historic Preservation Act* (NHPA), as amended in 1992 (16 USC 470 *et seq*.), and the *National Environmental Policy Act* (NEPA) (1969), and NPS *Director's Order-28, Cultural Resource Management Guideline* (1994), *Management Policies* (2006), and *Director's Order-12, Conservation Planning, Environmental Impact Analysis and Decision Making* (2001), require the consideration of impacts on historic structures either listed in or eligible to be listed in the National Register of Historic Places.

Cedar Grove Bridge was determined to be ineligible for inclusion in the National Register of Historic Places in consultation with the California state historic preservation office (SHPO) on March 25, 2009. As a result of this determination, no historic structures listed in or eligible for inclusion in the National Register of Historic Places would be affected by the proposed action. Therefore, this impact topic was dismissed from further analysis.

Archeological Resources

Cultural resource surveys of the Cedar Grove area were conducted in 1974, 1993 and 1997, and no archeological sites were identified (Napton 1974, Miller 1993 and Siefkin 1997). Although no archeological resources have been identified within the area of potential effect, monitoring of initial ground disturbance would occur. Should previously unknown cultural resources be encountered during construction activities, work would be halted in the discovery area and the park would consult according to 36 CFR 800.13 and, as appropriate, follow the provisions of the *Native American Graves Protection and Repatriation Act of 1990* (25 U.S.C. 3001-3013). Since there would be no impact on archeological resources from this project, this impact topic was dismissed from further analysis.

Cultural Landscapes

Cedar Grove Village has not been inventoried or evaluated as a cultural landscape, however park records show that the Cedar Grove bridge, Sentinel campground, entrance road, Cedar Grove Storage Shed (LCS# 056298), and additions to the Cedar Grove Ranger Station (LCS# 006041) were constructed during the 1930s and were built under the "New Deal" era work programs, including the Civilian Conservation Corps (CCC) when the public lands that became Kings Canyon National Park were managed by the Forest Service. The Forest Service designed the Cedar Grove area as the hub for recreational activities (primarily camping and hiking) in Kings Canyon National Park.

The replacement bridge would be built in the same location as the original bridge to preserve the line-of-sight connection from the entrance road to the Cedar Grove Lodge area. Thus, implementation of the proposed action would not alter the circulation features, spatial organization, or land use patterns of the landscape. The installation of the bridge would have no effect upon the potential National Register eligibility of the landscape. Because the integrity of the existing landscape would be unaffected, this impact topic was dismissed from further analysis.

Ethnographic Resources

Ethnographic resources are defined by the NPS as any "site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it" (*Director's Order-28*). There are twelve affiliated American Indian tribes traditionally associated with Sequoia and Kings Canyon National Parks. The tribal representatives were sent an informational letter on December 15, 2008, describing the proposed project and requesting input. There were no comments received. This EA will be provided to each tribe for their review and comment. If subsequent issues or concerns are identified, appropriate consultations would be undertaken. According to NPS professional staff and the FGMP/EIS (2006), to date, no ethnographic resources within the park have been determined eligible for listing in the National Register of Historic Places (NRHP). Because it is unlikely that ethnographic resources would be affected by the proposed project, and because appropriate steps would be taken to protect any ethnographic resources that are inadvertently discovered, the topic of ethnographic resources was dismissed as an impact topic.

Museum Collections

Museum collections include historic artifacts, natural specimens, and archival and manuscript material. The proposed project would have no impact on museum collections in the park. Therefore, this impact topic was dismissed from further analysis.

Indian Trust Resources

Secretarial Order 3175 requires that any anticipated impacts on Indian trust resources from a proposed project or action by Department of Interior agencies be explicitly addressed in environmental documents.

The federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes. There are no Indian trust resources at Sequoia and Kings Canyon National Parks (Tom Burge, pers. comm. 2008). The lands comprising the parks are not held in trust by the Secretary of the Interior for the benefit of Indians due to their status as Indians. Therefore, this impact was dismissed from further analysis.

ALTERNATIVES

The NPS identified and evaluated a range of alternatives to improve structural bridge deficiencies, improve natural and cultural resources protection, enhance visitor experience, and improve park operations. Two alternatives have been analyzed in detail in this EA:

- Alternative A: No Action
- Alternative B: Replace existing bridge with 280-foot-long bridge

Quantities of materials and types of equipment described in the alternatives below are based on initial design and may be slightly modified during final design to accommodate site specific requirements if the alternative is selected (Table 2). However, these modifications would be minimal and would not change overall project impacts. A preliminary proposed project schedule with project milestones is provided in Table 3 at the end of this section.

Table 4 compares how the two alternatives fulfill project objectives. Table 5 presents impacts of each alternative for comparative purposes along with a concise summary of each alternative's potential environmental effects. Alternatives considered and dismissed from detailed analysis are described at the end of this section.

ALTERNATIVE A: NO ACTION ALTERNATIVE

The no action alternative would be the continuation of existing conditions for the Cedar Grove Bridge. The bridge would continue to support a maximum load of seven tons. Should the no action alternative be selected, the NPS would respond to future needs and conditions associated with the Cedar Grove Bridge without major actions or changes in the present course. The no action alternative would include short-term and periodic minor repairs and/or improvement activities for continued operation of the bridge, such as asphalt patching, road striping, rail maintenance, repair of the sidewalk/catwalk and wooden decking, and repair of the guardrail along the road shoulder.

ALTERNATIVE B: MANAGEMENT PREFERRED ALTERNATIVE

The management preferred alternative consists of four elements: 1) preparing for demolition, construction, and restoration, 2) removing the existing bridge, 3) constructing the new bridge, and 4) protecting the bridge and restoring the river. These project elements are interrelated and would be undertaken as one project under this alternative. The bridge would be designed to reduce flow constriction, and to allow passage of a 100-year flood.

Demolition, construction, and restoration preparation

The proposed preparation activities would include moving equipment and materials to the project area, installing erosion-control measures, surveying the project area, and other preliminary activities.

Table 2. Preliminary list of construction equipment (FHWA, Eikermann 2009).*

Construction Activity	Types of equipment that could be used
Superstructure removal, foundation excavation, existing pier removal, and backfill voids left from pier removal	In-channel: Crane , excavator, track hoe, back hoe Upland: Concrete breaker, front end loader, dump truck, excavator
Construction of micro-piles, pier footings, pier columns, and pier caps	In-channel: Crane, excavator, track hoe, back hoe, drill-rig Upland: Front end loader, dump truck, cement mixer with chute
Abutment removal	Upland: Concrete breaker, crane, excavator, back hoe, front end loader, dump truck
Construct deck slab and endwalls	In-channel: Crane Upland: Front end loader, dump truck
Excavation of west embankment	In-channel: Track hoe, back hoe Upland: Front end loader, dump truck, excavator
Construction of abutments and wingwalls	In-channel: Track hoe, back hoe Upland: Front end loader, dump truck, excavator, cement mixer with chute
Construct bridge approaches	Upland: Excavator, front end loader, dump truck
Bridge protection and river restoration	In-channel: Track hoe, back hoe Upland: Front end loader, dump truck, and excavator

*This is a preliminary list of equipment that may be used during construction. It is not an all-inclusive list and may be modified during final design to accommodate site specific requirements.

- Staging areas for storage of construction equipment and materials would be established at the closed sections of the road approaching the bridge on each side of the river, at the day use parking area using half of the parking lot south of the road on the east side of the bridge, and at the Cedar Grove Storage Yard, located 2.5 miles east of Cedar Grove. An additional staging area may be established near the former concession employee housing area (the "picnic estate"), which is now abandoned. A temporary concrete batch plant may be established at one of the staging areas at Cedar Grove. This would require an approximately 75'×300' pad for the plant, water storage, small stockpiles of aggregate, and truck maneuvering room. The plant would use a sound attenuated generator for power, and require approximately 35 gallons of water per cubic yard of concrete.
- The Cedar Grove Bridge would be closed during demolition and construction. The North Side Road would be used as a detour for the Cedar Grove Lodge during this time. Due to inadequate turning radius, any vehicle 30 feet or longer (which is the size of a standard motor home) or a vehicle with trailer traveling west on the

North Side Road would be directed to a turnaround at the Lewis Creek Trailhead Parking Area. Drivers of longer vehicles traveling west on the Kings Canyon Scenic Byway that need to turn onto the North Side Road would also be directed to the Lewis Creek Trailhead Parking Area turnaround.

- Fiberoptic, electrical, and telephone lines, which are currently located under the bridge would be temporarily relocated from the bridge girders to two suitable trees spanning the river. The cables would be run down to the ground along the tree trunk from a sling. A conduit would be placed in a shallow trench and run back to the road to the splice box.
- Excess excavated material from the existing bridge removal and new bridge construction, which is estimated at 200 cubic yards, would be used as part of the restoration project.

Existing bridge removal

- Bridge demolition would involve removing the curbs, rails, and asphalt surface from the bridge deck; the wooden bridge deck; steel beams below the bridge deck; and abutments, wing walls, and piers.
- Sewer and water connections to the Cedar Grove Lodge would be maintained during construction to the extent practicable.
- Removing the piers and abutments would require the construction of a temporary access route to the stream to allow equipment access to the piers. This may involve adding fill material to the riverbank and streambed. Work on the west side abutment would include the removal of approximately 350 cubic yards of material.
- The demolition of the existing piers, abutments, and wingwalls would include breaking up the concrete structures and removing all material. Some excavation would be required at the base of the piers and abutments.
- River restoration activities would be completed during bridge removal. The depositional zone immediately upstream of the bridge along the center portion of the channel (Photo 2) appears to have been caused by the current bridge constriction and also may be contributing to erosion along the west bank upstream of the bridge. Approximately 170 cubic yards of material would be excavated from the depositional area and used to fill in the eroded portion of the channel along the west bank upstream of the bridge.

  The goal of this portion of the project would be to restore the channel to a configuration that more closely resembles the channel geometry in this reach. This work may also reduce the deposition potential upstream of the bridge and improve the hydraulic transition into the bridge section. However, given the significant velocities through this reach, additional channel training features (e.g. larger bed material coupled with uprooted trees, etc.) described in the section below on bridge protection and river

restoration would be constructed and maintained to keep the material in place.

Photo 2. Aerial view of Cedar Grove Bridge (FHWA 2006a).

New Bridge Construction

- The new 280-foot-long bridge would be constructed in the same location as the former bridge. The bridge would have steel girders placed on concrete bridge abutments and two concrete piers, and steel handrails with stone masonry pillars (Figure 3). The bridge would have a concrete deck to accommodate two 11-foot travel lanes

and a sidewalk with a curb on the south side. Both roadway approaches would be reconstructed.

- Construction of both piers would involve the use of micro-piles to minimize the amount of excavation needed for the pier footings. A pier form would be installed over the micro-piles and concrete would be pumped into the form. The form would later be removed and disposed of outside of the park. The construction of both piers would require the excavation of approximately 680 cubic yards of material. This excavation would be filled in by the construction of the pier cofferdams and footings. The construction of both piers, including the cofferdams, footings, columns, and backfill would result in approximately 100 square yards of in-water disturbance.

  Like the piers, forms for the abutments and wingwalls would be installed and concrete pumped into the form. The forms would later be removed and disposed of outside of the park at an approved disposal location. Construction of the west side abutment, wing wall, and riprap would result in approximately 30 square yards of in-water disturbance. Construction of the east side abutment, wing wall, and riprap would result in approximately 185 square yards of disturbance in the water and on the stream bank.

  This work would be done during low flow periods, which generally occur from August through September. In this case, low flow is defined as anything less than the ordinary high water mark (OHWM). The two-year flood delineation is being used as a rough estimate of the OHWM for this project. A two-year flood is the level of flood water expected to be equaled or exceeded every two years on average.

- At the base of the abutments, large riprap would be laid approximately 4 feet thick and extend up the river bank to 2 feet above the 50-year flood elevation. The abutment slopes would be constructed with materials that blend with the surrounding landscape. Approximately 500 cubic yards of rock stockpiled at the U.S. Forest Service (USFS) Convict Flat quarry is of the appropriate size for use on this project and has been approved for use by the USFS and the park. About 1,200 cubic yards of additional rock needed for the project would come from outside of the park from a park-approved commercial source.

- The bridge profile grade would be sloped to accommodate the sewer line to the lodge on the east side of the bridge. The slope would ensure gravity flow of the sewer line. To minimize disturbance and impacts on soils and vegetation outside of the road prism that would be caused by this realignment of the profile grade, a cut on the west approach would be needed. This cut would be gradual, starting just east of the entrance to the Sentinel Campground to just short of the bridge. No more than 10 trees would need to be removed to accommodate the cut. The cut bank would be stabilized by a native rock wall varying from approximately 1-4 feet high.

  The cut would require the realignment of the multi-use trail approximately 50 feet to the west of the current alignment to ensure

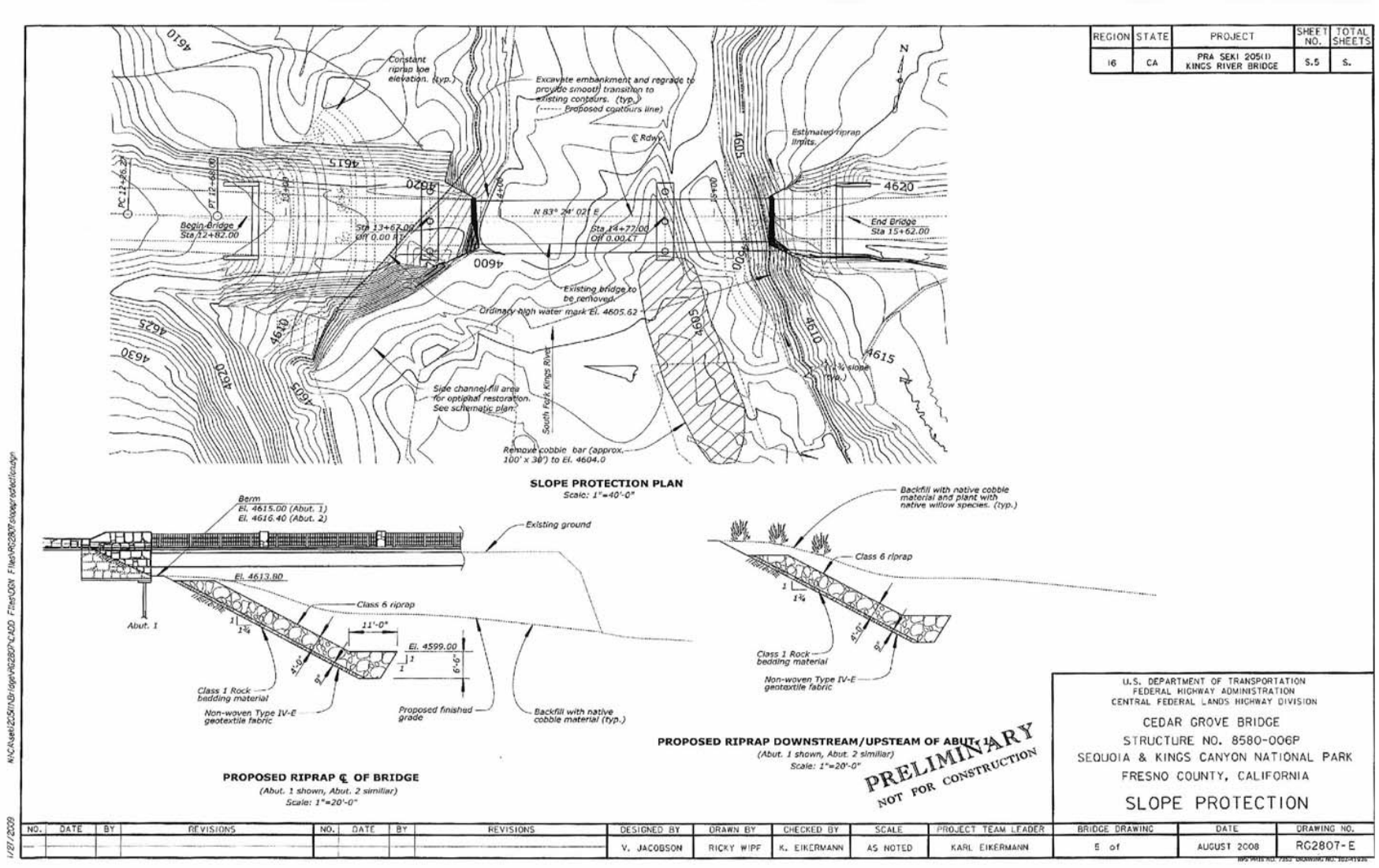


Figure 3. Preliminary Plan and Profile Cedar Grove Bridge (FHWA 2008).

a gradual slope to the crosswalk on the road. Approximately 90 linear feet of new multi-use trail would be constructed and minor trail realignment would occur on the other side of the road to meet the new crosswalk. The trail realignments would be routed around trees, and the original trail surface would be removed and revegetated. During construction, a detour would be delineated.

Additional fill may be necessary within the construction limits of the bridge approaches and the realignment of the multi-use trail. Tree wells may be installed to protect larger diameter trees within the construction limits and near the multi-use trail. A tree well is a wall, stone masonry or wood, installed around a tree and its root zone when the soil grade is raised to hold fill soil away from the tree trunk.

- To improve pedestrian access to the east side of the bridge, the bridge sidewalk and curb would be extended to the parking lot east of the bridge. A reinforced concrete retaining wall, approximately 8-10 feet tall, would be constructed along the sidewalk, and a stairway would be constructed midway to the parking lot access drive. To maintain a consistent appearance between the bridge and the walkway, the retaining wall and the stairway would be covered with a stone veneer.
- Following construction, the Lewis Creek Trailhead Parking Area would be restored to its pre-construction condition and parking configuration. The North Side Road would be rehabilitated if necessary to repair wear associated with increased construction and detour traffic.

Bridge protection and river restoration

- During construction, the cobble from the abovementioned depositional area would be excavated from the center of the channel and relocated to the highly-eroded area along the west bank of the river.
- As part of the preferred alternative, a wood reinforced floodplain or engineered log jam would be installed in the channel to protect the bridge abutment, stabilize the west bank of the river, and restore the channel to a configuration that more closely resembles the natural channel geometry in this reach (Figures 4,5,6, and 7). The design and size of the wood reinforced floodplain (Figure 4) may be modified based on available funding and materials, including logs and large rock.
- The engineered log jam/reinforced floodplain would be an interconnected log structure ballasted with large rock. Logs would be placed along the channel and stabilized with log pilings and fill material from the abovementioned depositional area, the materials from the west abutment, and a commercial source if needed. The structure would extend into the river 10 to 60 feet from the bank (depending on final design) and would be about 300 feet in length, filling in the eroded area and the void left from the removal of the west bridge abutment. Some excavation of the river bed would be necessary to ensure the logs are well embedded in the substrate.

- Log piles, about 14 inches in diameter at breast height (dbh) and 25 feet long, would be formed by excavating 3 to 5-foot-deep holes in the substrate and strategically placing the trees in the holes to help stabilize the log structure. Salvaged hazard or windfall trees from approved sources within the park, including some with root wads, would be placed to form an interconnected stacked structure. Rock ballast would then be placed within the stacked logs and piling to form the basic structure. Quarry spalls (4-8 inches in diameter rock pieces) would be placed over the rock and log structures to form a filter blanket.
- Pit run rock material and the excavated riverbed material would then be placed over the quarry spall filter blanket to form a growing medium for planting native trees. Any additional material needed for the project would come from a park-approved commercial source outside of the park.
- Monitoring to evaluate the structural integrity of the reinforced floodplain would be done annually and following high flow events. This would be accomplished by surveying precise locations of key members relative to a benchmark on shore, by determining whether the structure has lost key members, and by conducting a visual inspection of anchoring systems (WDFW 2008). Photo points would be established at strategic locations. Photos would be taken annually and following high flow events and compared with past photos to determine if maintenance would be needed. In this case, high flow is defined as anything greater than the ordinary high water mark (OHWM). The two-year flood delineation is being used as a rough estimate of the OHWM for this project. A two-year flood is the level of flood water expected to be equaled or exceeded every two years on average.

Table 3. Maximum Number and Size of Logs needed for Wood Reinforced Floodplain.

Size	With or Without Root Wads (w/ or w/o)	Number
2.5'×30'	w/o	34
2.5'×25'	w/	23
2.5'×25'	w/o	23
14"×15'	w/	20
14"×15'	w/o	60
2.5'×40'	w/	7
2.5'×40'	w/o	7

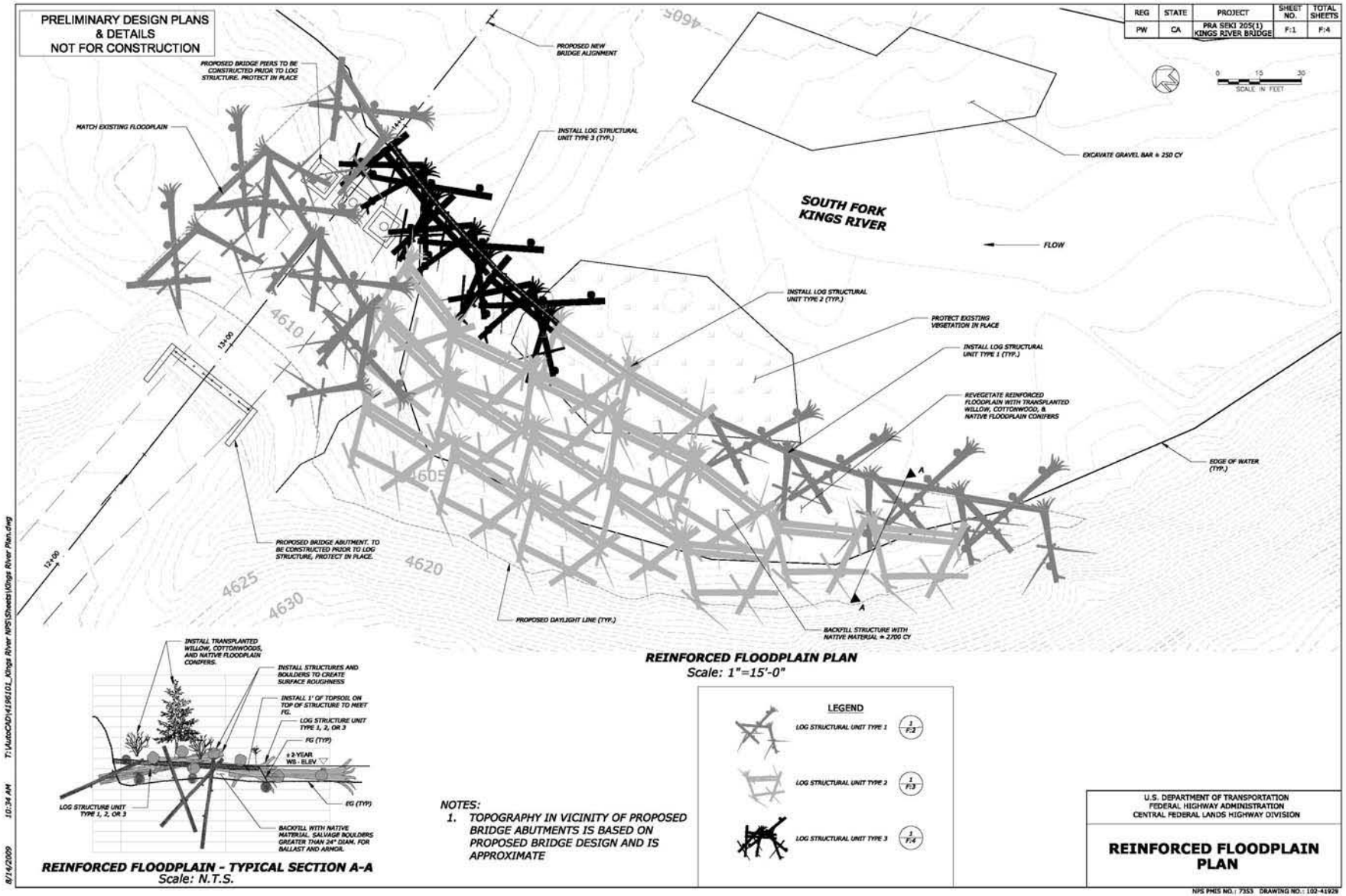


Figure 4. Schematic Design Plans for a reinforced floodplain (ENTRIX 2009).

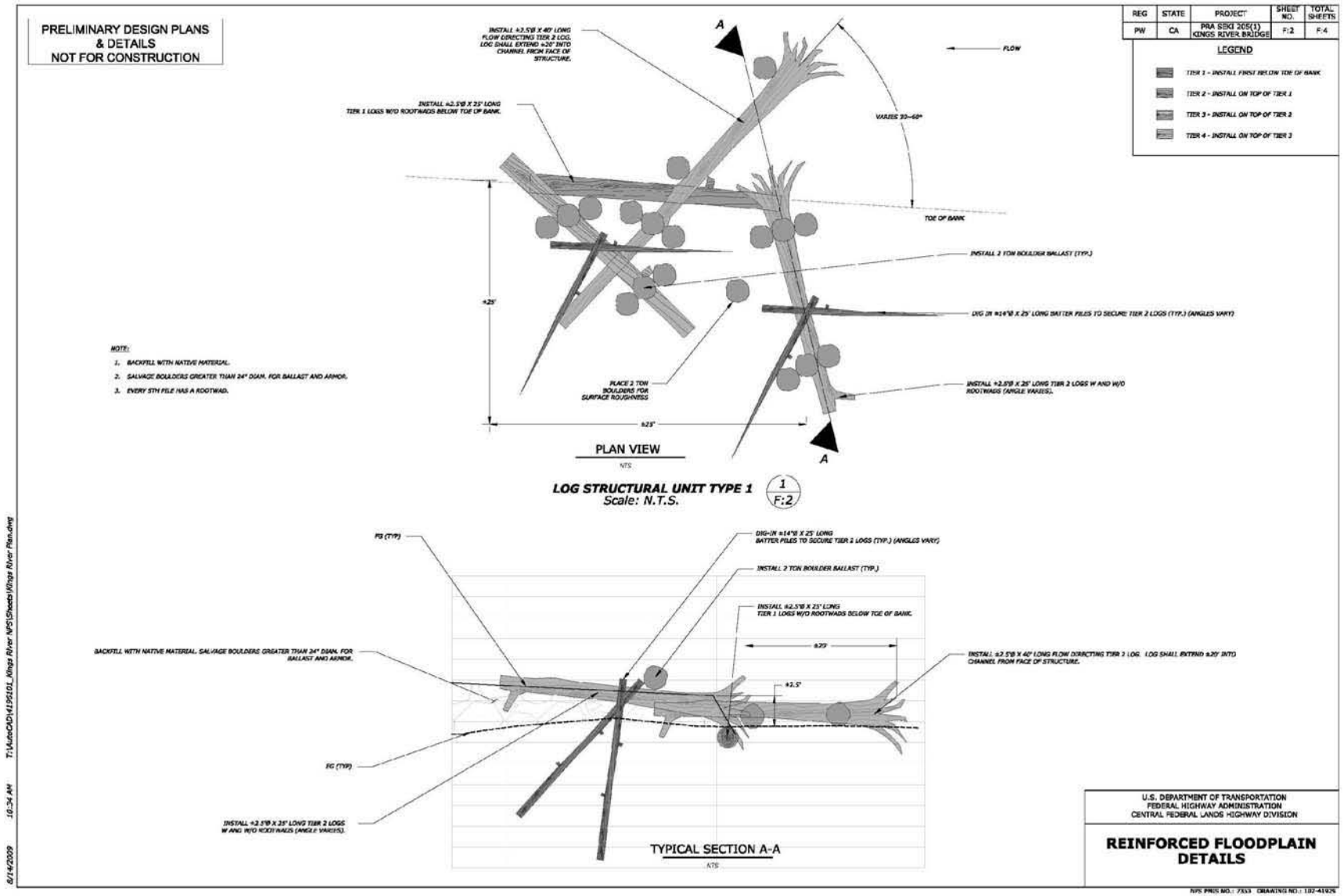


Figure 5. Structure Unit Type 1 (ENTRIX 2009).

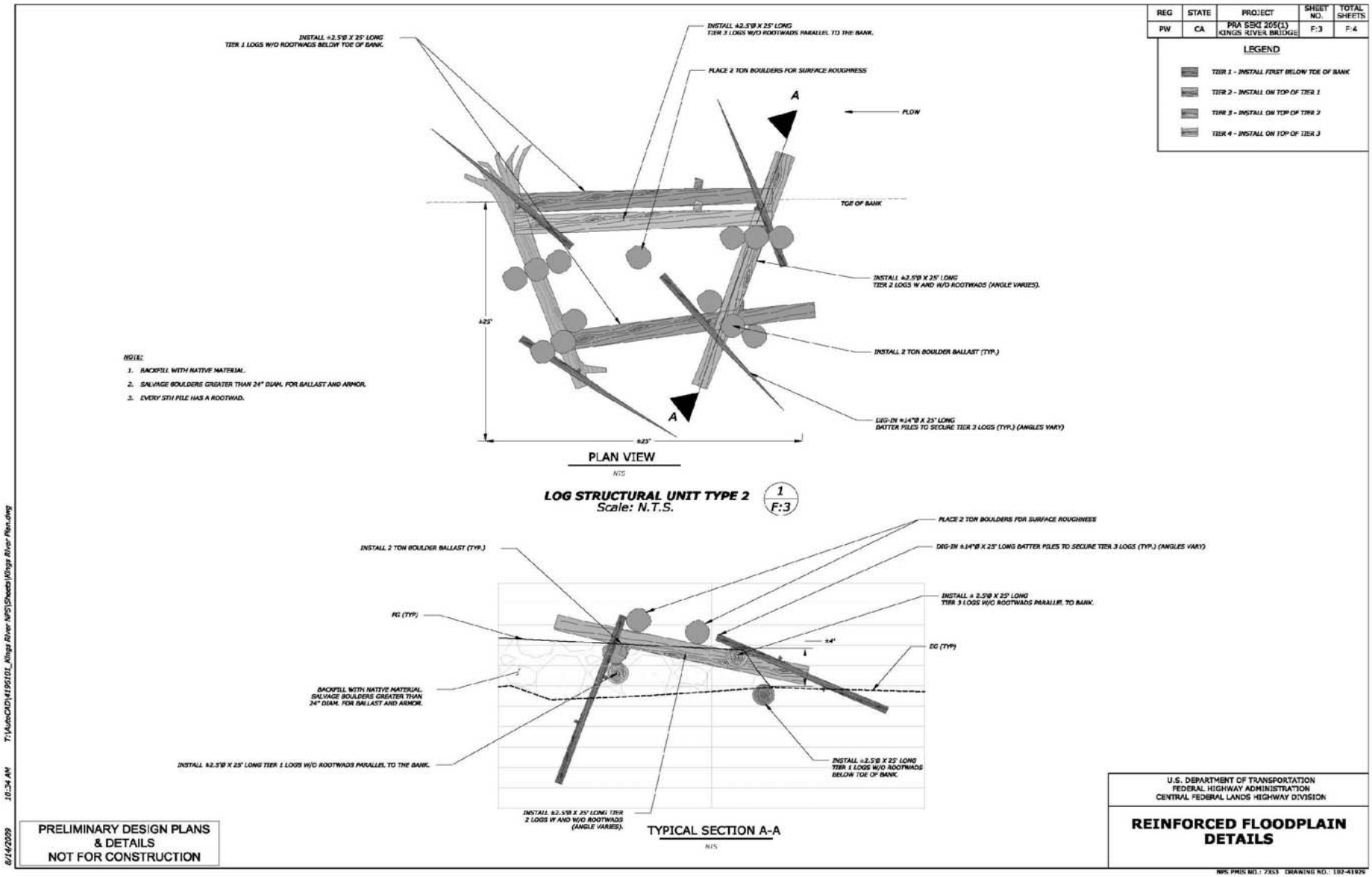


Figure 6. Log Structure Unit Type 2 (ENTRIX 2009).

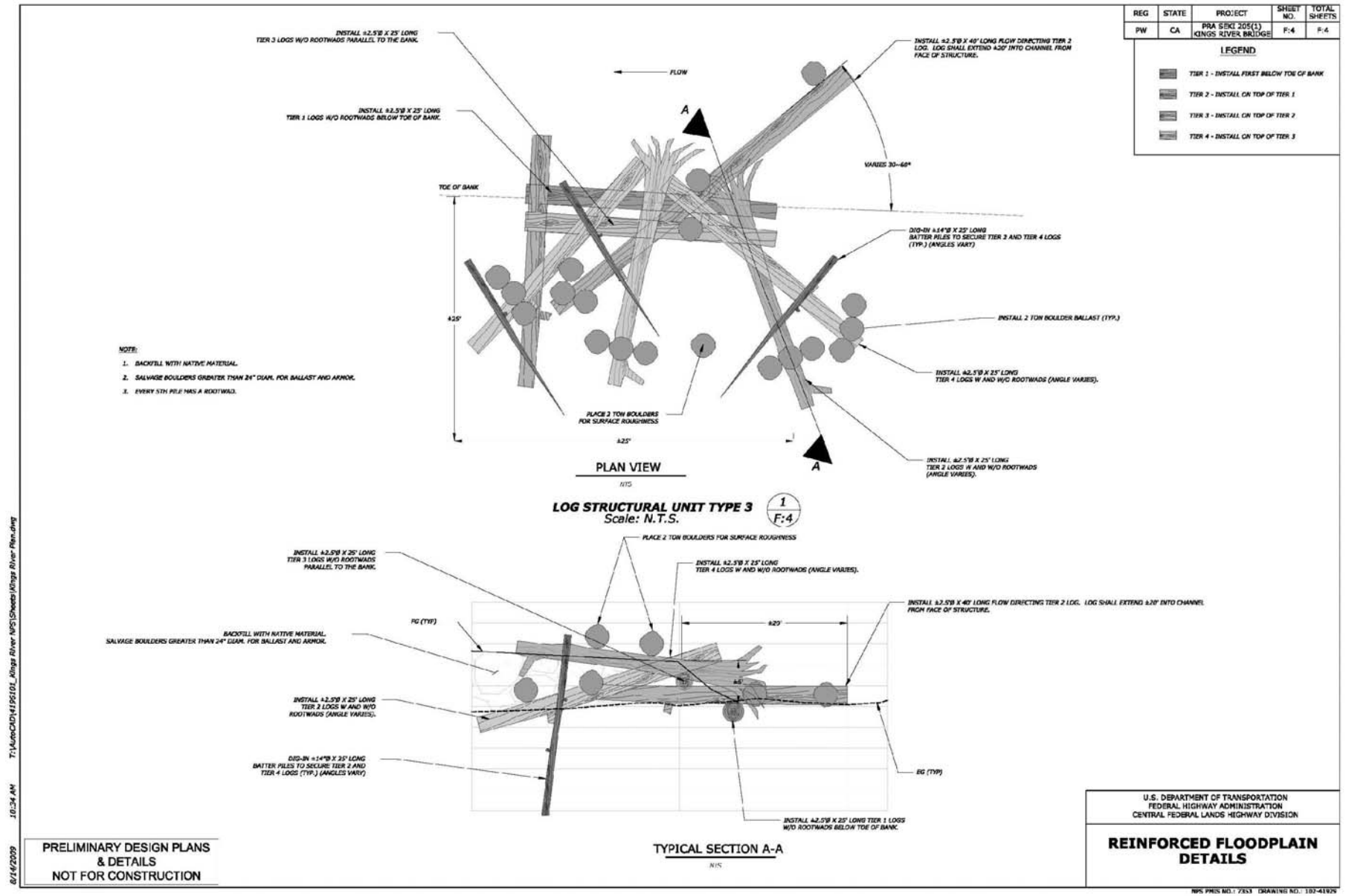


Figure 7. Log Structure Unit Type 3 (ENTRIX 2009).

GENERAL CONSTRUCTION SCHEDULE AND COSTS

Construction to replace the Cedar Grove Bridge would take place over a two year period starting in late summer or fall. Construction could begin or extend beyond the timeframe identified previously based on weather and river conditions, but only after the superintendent receives a formal written request and grants permission. In 2009 the estimated value of the construction effort is approximately $6.1 million.

Table 4. Preliminary construction schedule.

Construction Milestone	Potential Timing of Construction Activities
Demolition, construction, and restoration preparation	Fall
Superstructure removal, foundation excavation, existing pier removal, and backfill piers	Fall
Construction of micro-piles, pier footings, pier columns, and pier caps	Fall
Construction of river restoration (reinforced floodplain)	Fall
Winter Shutdown	Winter
Abutment removal	Spring - Summer
Construct deck slab and endwalls	Summer
Excavation of west embankment	Summer
Construction of abutments and wingwalls	Summer
Construct bridge approaches	Summer

*It is estimated that the bridge demolition, construction, and the restoration project would be done over two construction seasons. This schedule is preliminary and is subject to change.

MITIGATION MEASURES

Mitigation measures would be implemented to protect resources values and reduce adverse effects and would apply to the management preferred alternative. All protection measures would be clearly stated in the construction specifications/special construction requirements.

General Measures

- Construction limits would be identified with construction tape or similar material prior to any construction activity. Workers would be instructed to avoid conducting activities and disturbing areas beyond the construction limits.
- All tools, equipment, barricades, signs, surplus materials, demolition debris and rubbish would be removed from the project work limits upon project completion. Any asphalt surfaces damaged during the project would be repaired to its original condition.
- Contractors would be required to properly maintain construction equipment and generators (i.e., mufflers) to minimize noise from use of the equipment.

- All equipment on the project would be maintained in a clean and well-functioning state to avoid or minimize contamination from automotive fluids. All equipment would be checked daily.
- Materials would be stored, used, and disposed in a proper manner.
- A hazardous spill plan would be approved by the park prior to construction. This plan would state what actions would be taken in the case of a spill, notification measures, and preventive measures to be implemented, such as the placement of refueling facilities, storage, and handling of hazardous materials, etc.
- To reduce the potential for cement spills, a confined area with appropriate containment and erosion control measures would be designated in one of the staging areas for washing out cement trucks.
- Where appropriate and available "environmentally friendly" grease, hydraulic oil, and bar and chain oil would be used. These lubricants are vegetable or mineral oil based, less toxic and biodegradable.
- Best management practices (BMPs) for drainage and sediment control would be implemented to prevent or reduce nonpoint source pollution and minimize soil loss and sedimentation in drainage areas. BMPs would include all or some of the following actions, depending on site-specific requirements:
    - Disturbed areas would be kept as small as possible to minimize exposed soil and the potential for erosion;
    - Waste, and excess excavated materials would be stored outside of drainages to avoid sedimentation. Silt fences, temporary earthen berms, temporary water bars, sediment traps, stone check dams, or other equivalent measures would be installed around the perimeter of stockpiled fill material;
    - Regular site inspections would occur during construction to ensure that erosion-control measures were properly installed and are functioning effectively.
    - A portable holding basin would be utilized at the concrete batch plant to contain waste from cleaning out the concrete trucks.

Water Quality, Hydrology and Stream Flow Characteristics

- All work in the streambed would be performed during periods of low flow, generally from late summer through early fall.
- Prior to working in the stream, the stream flow would be diverted around the work area. Temporary sediment traps, erosion check screens, coffer dams, water-inflated coffer dams (a re-useable water inflated dam – a single tube devise with internal support for stability) and/or filters would be used to divert the main flow and reduce turbidity downstream from the project site. All

in-stream devices would be removed between construction seasons and disturbed areas would be stabilized to prevent erosion. Diversions would be constructed in a manner that would provide a continuous flow to downstream reaches.

- Temporary work pads consisting of onsite alluvium, clean silt-free gravel, or river rock would be built for large stationary equipment working in the stream channel to provide a stable substrate.
- All heavy equipment operated in the stream channel would drive slowly and carefully to minimize sediment movement and resulting increased turbidity.
- At all upland cut and fill areas, erosion and sedimentation control measures would be implemented to minimize impacts on water quality. These measures would remain until final site stabilization (all soil disturbing activities at the site have been completed and that a uniform perennial vegetative cover with a density of at least 70% of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed).
- Water needed for construction and dust control would come from the existing developed water systems within the parks and would not be diverted from surface waters.
- The sewer lines would be encased in the appropriate grade sleeve, according to state regulations, to protect the lines and prevent any potential leakage from impacting water quality. Upon relocation, all utility lines would be monitored regularly to ensure all lines are operational.

Wild and Scenic Rivers

- To preserve the aesthetic qualities of the scenic river, the cut bank on the west approach to the bridge would be stabilized by a native rock wall.
- To maintain a consistent appearance between the bridge and the walkway and minimize the visual contrast of the bridge, the retaining wall on the east side of the wall would be covered with a rock veneer.
- Any riprap placed on the soil surface would consist of materials that blend with the surrounding landscape.

Floodplains/Wetlands

- Floodplain and wetland protection BMPs outlined in Appendix F would be adhered to, thus limiting impacts on wetlands and floodplains.

Vegetation, Non-Native Species, and Soils

- A plant survey would be done prior to project construction to determine the presence of rare plants. If rare plants are found, they would be relocated if possible, as determined by park botanist.
- A revegetation plan would be developed for the purposes of restoring native vegetation to the project site, minimizing erosion, and stabilizing the bank and disturbed areas.
- Riparian vegetation would be planted as soon as possible to minimize sedimentation associated with bare ground. A primary revegetation technique for willows would be cutting and planting willow stakes. This would be done concurrently with the contractor's placement of riprap to allow the stakes to be placed between cracks in the rock. Other types of vegetation would also be planted, such as cottonwoods and pines, where appropriate.
- Topsoil would be removed if appropriate as determined by the park botanist, from areas of construction and stored for later use. After project completion, ground surface treatment may include grading to natural contours, replacing topsoil, incorporating native litter and duff layer over salvaged topsoil and, where necessary, seeding and planting.
- Reclaimed areas would be monitored after construction to determine if reclamation efforts are successful or if additional remedial actions are necessary. Remedial actions may include installation of erosion-control structures, reseeding, topsoil placement, and/or replanting the area, hand-pulling, and controlling non-native plant species with herbicide.
- In an effort to avoid introduction of non-native/noxious plant species, no hay or straw bales would be used during revegetation or for temporary erosion control.
- All construction equipment would be pressure washed/steam cleaned prior to entering the parks to ensure that all equipment and machinery are weed free. Construction equipment would be inspected by NPS staff prior to entering the parks to ensure compliance with cleanliness requirements. Inadequately cleaned equipment would be rejected.
- All haul trucks bringing fill materials (excluding asphalt) from outside the parks would be covered to prevent seed transport and dust deposition along the road corridor.
- Equipment and disturbance would be limited to within the construction limits, and to roadsides, bridge areas, and staging areas
- All fill, rock or additional topsoil needed for project work would be obtained from NPS approved weed free sources. If weed free quarry sources cannot be located, the contractor would be required to scrape away topsoil at the quarry and/or acquire

freshly exposed material with minimal seed deposition and washing of coarse materials (rip rap).

- Disturbed areas would be monitored for up to three years following construction to identify growth of noxious weeds or non-native vegetation. Treatment of non-native vegetation would be completed in accordance with NPS 77-7, Integrated Pest Management Manual.

Visitor Experience and Health and Safety

- Visitors, park and concessioner employees, and others would be notified when road closures or traffic delays would occur. Information on the project schedule would be provided to neighboring communities, on the park website, at visitor centers and entrance stations.
- The bridge would be closed during construction to protect park visitors and employees. Signs and construction fencing would be used to prevent entry and crossings by visitors. The North Side Road would be used as a detour for the Cedar Grove Lodge during this time.
- Signs would be posted at the Lewis Creek Trailhead Parking Area to warn people to use caution during the detour.

Wildlife

- Construction activities would be limited to daylight hours with the exception of when water and sewer would be transferred, which could occur at night.
- To reduce noise disturbance and limit impacts on breeding avian and mammalian species, all tree removal work would be done in the fall or early spring, if possible. If trees with a dbh of 24 inches or greater need to be removed outside of this time frame, trees would be identified for removal and evaluated for nesting activity by a park biologist. If nesting is found, the tree would be left in place or removed outside of the breeding season.
- Feeding or approaching wildlife would be prohibited by construction personnel.
- Wildlife collisions would be reported to park personnel.
- Park biologist or ranger would be notified if bears loiter in the area and appropriate response would be provided.
- A litter control program would be implemented during construction to eliminate the accumulation of trash. All food would be stored in bear proof containers except when it is being consumed. Food stored in vehicles would be in bear proof containers. Spilled food would be cleaned up. Food related garbage would be removed from the project area daily and taken to an animal resistant dumpster within the park.

Air Quality

- Dust control would occur, as needed, on active work areas where dirt or fine particles are exposed.
- The contractor would not leave vehicles idling for more than five minutes when parked or not in use.
- Asphalt plants would be located outside the parks. Small quantities of asphalt may be stored for a short-term at designated staging areas.

Cultural Resources

- The park archeologist would monitor initial ground disturbing activities outside of the river channel.
- Should any archeological resources be uncovered during construction, work would be halted in the area and the park archaeologist, Office of Archeology and Historic Preservation (OAHP), and appropriate Native American Tribes would be contacted for further consultation.
- Park cultural resources staff would be available during construction to advise or take appropriate actions should any archeological resources be uncovered during construction.
- In the unlikely event that human remains are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (1990) would be followed.
- The NPS would ensure that all contractors and subcontractors are informed of the penalties for illegally collecting artifacts or intentionally damaging archeological sites or historic properties. Contractors and subcontractors also would be instructed on procedures to follow in case previously unknown archeological resources are uncovered during construction.

ALTERNATIVES CONSIDERED BUT DISMISSED

Bridge Replacement with 330-foot Bridge and River Restoration

This alternative considered the removal and replacement of the existing bridge with a 330-foot-long bridge. This alternative would accomplish the same goals as the management preferred alternative by improving the river's ability to flow in a wild and natural course, protecting the river's ORVs as a National Wild and Scenic River and providing a safe, durable, sustainable passage for vehicles, pedestrians, bicycles, and utilities crossing the South Fork of the Kings River at Cedar Grove Village. It would intrude slightly less on the natural floodplain than the management preferred alternative. However, the construction of a 330-foot-long bridge would not provide greater hydraulic benefit than the construction of the 280-foot-long bridge (NPS Water Resources Division, Smillie and FHWA/CFLHD, Hogan, pers. comm. 2009) nor would it alter the short- and long-term effects and meet the project objectives better than the management preferred alternative. Thus, the construction of the 330-foot-long bridge would be very similar to the less expensive

280-foot-long bridge alternative, would have similar adverse and beneficial effects, and, thus, since it closely resembles the management preferred alternative, has been dismissed from further detailed analysis.

Improvement of the North Side Road Including the West Intersection

This alternative was suggested during public scoping and would include improving the North Side Road and removing the vehicle Cedar Grove Bridge and replacing it with a pedestrian bridge that could accommodate bicycles. The North Site Road would need to be widened to two lanes to better accommodate larger vehicles, such as RVs and vehicles with trailers. The widening would result in the removal of wetlands that are located adjacent to the roadway. Portions of the roadway are also located in a floodplain. Low spots subject to flooding would also be raised, the shoulder hardened, and the surface paved for its entire length.

There is a very sharp turn at the intersection of the North Side Road and the Kings Canyon Scenic Byway. While the intersection is easily navigated by traffic coming from or going west towards Grant Grove, it is difficult for large vehicles (stock trucks, recreational vehicles (RVs), fire engines, boom trucks, snow plows, garbage trucks, etc.) heading westbound on the scenic byway to negotiate the turn east onto the North Side Road, even if they cross the center line and use all of the available pavement. There is no reasonable place to the west (e.g., Lewis Creek Trailhead Parking Area) where large vehicles can safely turn around and approach from that direction. Therefore, all such traffic currently uses the Cedar Grove Bridge. The improvement of the turning radius at the west end where it intersects the Kings Canyon Scenic Byway would require the removal of the rock face adjacent to the road, which could result in slope instability in the long-term, which may lead to landslides and result in increased maintenance needs.

The road improvements proposed in this alternative would eliminate the need for a vehicle bridge at Cedar Grove Village. It would still require a constructed bridge for pedestrians, bicycles, and utilities. While the replacement of a vehicle bridge with a smaller pedestrian bridge would minimize impacts on a wild and scenic river, there would still be a constructed bridge across the South Fork of the Kings River at Cedar Grove creating impacts on the river.

In addition, the road improvements would not be sustainable in the long-term due to periodic flooding in the area. This alternative would not meet the project objective to provide safe, durable, sustainable passage for vehicles due to the reasons listed above and would not be consistent with the direction of the FGMP/EIS (page 126), which states that Cedar Grove Village bridge should be replaced (NPS 2007).Therefore, this alternative was dismissed from further analysis.

Rebuild the Bridge in a New Location

The present bridge site is less than ideal because it is located close to a bend in the river. A thorough search of the river was conducted by NPS and FHWA staff for approximately 0.5 mile above and below the current site. Several possible sites were identified, but they were all judged to be inferior to the present site. Constructing a bridge at any of the alternative locations would result in greater environmental impacts and in higher construction costs than reconstructing the bridge at the existing location because the approach road and utilities would also have to be relocated/constructed. The FGMP/EIS specifies that replacement locations should be assessed for less resource impacts and improved sustainability (NPS 2007). None of the alternative locations would have resulted in less resource impacts or improved sustainability when compared to the current location. Therefore, this alternative was dismissed from further analysis.

Relocate Cedar Grove Village

The bridge is needed because the campgrounds, numerous trailheads, and the Kings Canyon Scenic Byway are on the south side of the river while most of the concession and park administrative facilities are on the north side. This alternative would eliminate the need for the bridge by relocating Cedar Grove Village and the park administrative facilities to the south side of the river. There are few suitable development sites on the south side of the river that could be used for these purposes. It would require additional development within Kings Canyon, leading to increased resource impacts when compared with the management preferred alternative. In addition, this alternative would not be consistent with the direction of the FGMP/EIS (NPS 2007) which states that Cedar Grove Village will be made more efficient and will continue to offer a variety of overnight accommodations. Cedar Grove Bridge will continue to connect Cedar Grove Village with the Kings Canyon Scenic Byway. The environmental impacts and the cost of relocating the facilities would also be significantly greater than to reconstruct the bridge. Therefore, this alternative was dismissed from further analysis.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

The CEQ defines the Environmentally Preferred Alternative as "…the alternative that will promote the national environmental policy as expressed in the National Environmental Policy Act § 101." Section 101 states that, "…it is the continuing responsibility of the Federal Government to:

1. fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
2. assure for all generations safe, healthful, productive, and esthetically and culturally pleasing surroundings;
3. attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;

4. preserve important historic, cultural, and natural aspects of our national heritage and maintaining, wherever possible, an environment that supports diversity and variety of individual choice;
5. achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities; and enhance the quality of renewable resources and approaching the maximum attainable recycling of depletable resources."

The identification of the "Environmentally Preferred Alternative" was based on an analysis that balances factors such as physical impacts on various aspects of the environment, mitigation measures to deal with impacts, and other factors including the statutory mission of the NPS and the purposes for the project.

The no action alternative is not the environmentally preferred alternative because it would not address the deteriorating bridge conditions for employees and visitors (criteria 2, 3, and 5) as well as the management preferred alternative nor would it fulfill the responsibilities of each generation as trustee of the environment by improving the degraded condition of the Cedar Grove segment of the South Fork of the Kings River, a designated wild and scenic river (criterion 1).

The environmentally preferred alternative in this EA is the NPS management preferred alternative. This alternative was selected based on the following criteria:

- it protects public and employee health, safety, and welfare by addressing safety concerns associated with deteriorating bridge conditions (NEPA criteria 2, 3, and 5);
- it prevents the loss of cultural and natural resources by improving the degraded condition of the Cedar Grove segment of the South Fork of the Kings River, a designated wild and scenic river (NEPA criteria 1, 2, 3, 4, and 5); and
- it improves operations efficiency and sustainability by reducing the need for ongoing road maintenance and the consumption of depletable resources associated with such maintenance (criteria 1 and 6).

Overall, alternative B would meet the park's planning objective of improving the river's ability to flow in a wild and natural course to better protect the river's Outstandingly Remarkable Values (ORVs) as a National Wild and Scenic River. It would also provide a safe, durable, sustainable passage for vehicles, pedestrians, bicycles, and utilities crossing the South Fork of the Kings River at Cedar Grove Lodge.

Table 5. Comparative summary of how alternatives meet project objectives.

Project objectives	No action alternative	Management preferred alternative
Provide safe vehicular, pedestrian, and bicycle access to Cedar Grove Village in a manner that lessens resource impacts and improves sustainability	Would not provide a safe, durable, sustainable passage for vehicles because of the 7 ton weight limit.	Would meet the objective of providing a safe, durable, sustainable passage for vehicles, pedestrians, and bicycles by improving the carrying capacity of the bridge to carry heavier vehicles.
Provide utilities to the Cedar Grove Village in a safe and sustainable manner	Would continue to provide utilities to the Cedar Grove Village in a safe and sustainable manner.	Would provide utilities to the Cedar Grove Village in a safe and sustainable manner.
Improve the Kings River's ability to flow in a wild and natural course and better protect the river's ORVs	Would not improve the river's ability to flow in a wild and natural course or better protect the river's ORVs as a National Scenic River as well as the management preferred alternative.	Would improve the Kings River's ability to flow in a wild and natural course and better protect the river's ORVs by reducing the constriction of the river channel.
Protect other natural and cultural resources in the project area, including floodplains, riparian areas, and wetlands	Would not protect other natural and cultural resources in the project area, including floodplains, riparian areas, and wetlands, as well as the management preferred alternative because of the continued constriction of the river channel causing impacts on floodplains, riparian areas, and wetlands.	Would protect other natural resources in the project area, including floodplains, riparian areas, and wetlands, by stabilizing the west bank of the river through the installation of the reinforced floodplain.
Protect park facilities downstream of the bridge	Would not protect park facilities downstream of the bridge as well as the management preferred alternative due to the constriction of the river, which would eventually cause instability downstream of the bridge.	The installation of the reinforced floodplain would protect park facilities downstream of the bridge.

Table 6 summarizes the short- and long-term impacts that would potentially occur to each impact topic under the no action and management preferred alternatives. A more detailed analysis is found in the Environmental Consequences chapter.

Table 6. Comparative summary of potential environmental impacts.

Potential Environmental Impacts		
Impact Topic	**No action alternative**	**Management preferred alternative**
Water Quality	Impacts on water quality would be local, short-term, minor, adverse impacts due to erosion of the west bank and also maintenance of the bridge resulting from high flow events, increasing turbidity and conductivity. Cumulative effects would be short-term, minor, and adverse.	Impacts on water quality would be short-term, moderate, and adverse from replacement of the bridge and the river restoration work. These impacts would be mainly from in-stream work, which may generate short-term erosion and sediment transport down the river, increasing turbidity and conductivity. The decrease in erosion of the river bank from river bank stabilization resulting from the restoration work would have a long-term, beneficial effect on water quality. Cumulative effects to water quality would be short- and long-term, minor to moderate, beneficial and adverse.
Hydrology and Stream Flow Characteristics	Impacts on stream flow characteristics would be local, short-term, minor to moderate, and adverse from regular needed maintenance as well as long-term, moderate, and adverse as a result of continued erosion of the west bank from high flow events and constriction of the river channel. Cumulative effects would be long-term moderate and adverse.	Impacts on stream flow characteristics would be short-term, minor to moderate, and adverse from construction and river restoration work. However, there would also be long-term, beneficial impacts resulting from replacement of the existing bridge with a longer bridge and the restoration component of the project. Cumulative effects would be short-term, minor to moderate, and adverse, as well as long-term, beneficial.
Wild and Scenic Rivers	Under the no action alternative, there would be long-term, moderate, adverse impacts on the free-flowing character of the river and short- and long-term minor adverse impacts on the scenic ORV. There would be localized, short-term negligible adverse impacts on the river's geologic and recreation ORVs after high flow events due to maintenance and emergency activities. The no action alternative would contribute slightly to the cumulative effects because there is a high likelihood that future repairs and emergency maintenance would be required resulting in short- and long-term, moderate adverse cumulative effects to the river ORVs and free-flowing character.	Alternative B would result in short-term, moderate, adverse impacts on the free-flowing character and ORVs of the river from the project work. There would be long-term, moderate, adverse impacts on the scenic ORV from the continued existence of the bridge on the river. The management preferred alternative would result in localized, long-term, beneficial effects to the free-flowing condition of the river as a result of installing a longer bridge, and long-term beneficial effects on recreation ORVs by provide safe passage across the bridge. Cumulative effects would be short-term moderate adverse to the free flowing character and ORVs, and long-term moderate adverse and beneficial.

Potential Environmental Impacts		
Impact Topic	**No action alternative**	**Management preferred alternative**
Floodplains	Under the no action alternative, there would be local, short- and long-term negligible to minor adverse impacts on the floodplain. Cumulative impacts would be short- and long-term, moderate and adverse.	Alternative B would result in short-term, minor, adverse impacts on the floodplain from replacement of the bridge and the river restoration work. However, there would also be long-term, beneficial impacts on the floodplain due to the replacement of the existing bridge with the longer bridge and the restoration project. Cumulative effects would be short- and long-term, minor, and adverse as well as long-term, beneficial.
Wetlands	Impacts on riverine wetlands would be local, short term, minor and adverse. Cumulative effects would be short-term, minor and adverse.	Alternative B would result in short-term, minor, adverse impacts on wetlands from bridge construction and the river restoration work. There would be long-term, beneficial effects to riverine wetlands as a result of the bridge replacement and the restoration project. Cumulative effects would be short-term, minor and adverse, as well as long-term and beneficial.
Vegetation and Non-native Species	Alternative A would result in localized, short-term, negligible, adverse impacts on vegetation and non-native species from minimal removal of vegetation or compacting root systems during routine maintenance activities. There would be short- and long-term minor adverse cumulative effects to vegetation.	This alternative would result in localized, short-term, minor impacts from the removal of vegetation; and regional, short-term and long-term, moderate, adverse impacts on vegetation as a result in an increased potential for the introduction of non-native species. The planting of native species after the project work would result in long-term beneficial effects. Cumulative effects would be short- and long-term, minor, and adverse and long-term and beneficial.
Wildlife and Fisheries	The existing bridge and facilities would continue to effect wildlife and fisheries resulting in long-term negligible to minor adverse and localized impacts.	Alternative B would result in short-term negligible to minor adverse effects to wildlife and fisheries in the project area, and could result in long-term beneficial effects to fisheries if river restoration activities are successful. Cumulative effects would be short-term, negligible to minor and adverse.
Visitor Experience and Health and Safety	There would be local, short-term, negligible to minor, adverse impacts on visitor experience resulting from increased future bridge maintenance activities. Cumulative impacts would be short-term, negligible to minor, and adverse.	Alternative B would result short-term, minor, adverse impacts on visitor experience from construction and restoration activities. However, there would be long-term beneficial effects to visitor experience and health and safety by increasing the load capacity of the bridge, providing an accessible sidewalk, and widening travel lanes. Cumulative effects would be short-term, negligible to minor and adverse, and long-term and beneficial.

AFFECTED ENVIRONMENT

Detailed information on the natural, cultural, and human resources that may be impacted from the proposed project are described below.

WATER QUALITY

The water quality of the South Fork of the Kings River in Cedar Grove is good, with some human sources of pollutants to the creek from the surrounding campgrounds, parking lots, and people swimming in the water.

Surface waters in the parks contain concentrations of dissolved constituents that are so diluted that the electrical conductivities are very low. Streams generally have the same conductivity of distilled water. One consequence of such pure water is that it is poorly buffered (limited ability to absorb water chemistry changes or additions), making the ecosystem sensitive to human disturbance and pollution. Ion concentrations do increase as elevation decreases. Conductivities may increase when the rivers reach the park boundary. This is partially because marble, schist, and other metamorphic rocks add significant dissolved constituents, forming a band along much of the western portion of these parks and at several other scattered locations (NPS 2007).

Surface water is also very clear with low turbidity. Nutrients like phosphate or nitrate are generally very low and ammonia is generally undetectable. The water is normally saturated with oxygen and generally quite cold (8-16 degrees Celsius). Park surface waters contain some biota (e.g. *Giardia lamblia*, *Campylobacter*, *Cryptosporidium*) that can be harmful if consumed (NPS 2007).

The primary threats to water quality are air pollution, loss of natural fire, runoff from park facilities, and runoff from heavy visitor use areas. The single biggest threat is air pollution. Air pollution adds acidic deposition, nutrients, and other contaminants to park waters (Cory et al. 1970; Melack et al. 1985, 1995; Sickman and Melack 1989; Williams and Melack 1997; Zabik and Seiber 1993). Fire affects nutrients, buffering capacity, water temperature, sediment transport rates, and other water characteristics. Park facilities generate sewage effluent. In addition to sewage effluent, nonpoint pollution sources, such as recreational activities, roads, and parking lots can contribute biological, physical, and chemical pollutants into aquatic systems (NPS 2007).

HYDROLOGY AND STREAM FLOW CHARACTERISTICS

One of the large river systems with headwaters within the parks is the South and Middle Forks of the Kings River. Surface water occurs primarily as rivers and streams at lower elevations, with a greater occurrence of lakes and ponds at higher elevations. The quantity of surface flow follows an annual cycle, with the lowest flows typically occurring in August and the highest flows in May or June. Spring flows are primarily snowmelt from glaciers and snowpack at higher elevations; by late August, the source is primarily groundwater (NPS 2007).

The portions of the Middle and South Forks of the Kings River managed by the NPS begin in glacial lakes above timberline and flow though deep, steep-sided canyons, over falls and cataracts, and eventually come together at the main stem of the Kings River in the Sequoia National Forest (NPS 2007). No recording stream gauges were identified along this reach of the South Fork of the Kings River that could be used to verify the computed flows. The Watershed Modeling System was used to compute the drainage basin and discharges using a U.S. Geological Survey (USGS) regional regression equation for the Sierra Nevada. The data input to the equation consisted of site specific historic rainfall values from the National Oceanic and Atmospheric Administration (NOAA) Atlas 2, the Precipitation-frequency Atlas of the Western United States. The drainage basin is approximately 357 square miles (FHWA 2006). The results of the peak flow discharge computations are in Table 7. According to park records, actual recorded flood intervals that reach a height of a 50-year flood for this portion of the South Fork of the Kings River have occurred nine times in the past 70 years.

Table 7. USGS Regression Equation Computed Discharges for the South Fork Kings River at Cedar Grove Bridge (FHWA 2006).

Recurrence Interval (yrs)	Discharge (cfs)
2	1,600
5	3,935
10	5,800
25	9,980
50	13,300
100	18,500
500	33,300

Riffles and pools are the dominant channel bed morphology. Both bed load material and bank materials are predominantly gravel and cobbles. No bedrock is observed in the streambanks or channel in the project area. Riparian vegetation consists of large conifer trees, cottonwoods, and oaks with willow growing on the gravel bar that has developed between the side channel and the main channel of the river. The west river bank has been severely eroded as a result of the constriction of the river by the existing bridge.

WILD AND SCENIC RIVERS

The Kings River is the largest free-flowing river in the Sierra Nevada (NPS 2007). Approximately 88.8 river miles of the Middle Fork, South Fork, and main stem of the Kings River were added to the national wild and scenic rivers system on November 3, 1987 (PL 100-150).

The portions of the Middle and South Forks of the Kings River managed by the NPS begin in glacial lakes above timberline and flow

through deep, steep-sided canyons, over falls and cataracts, and eventually become an outstanding whitewater rafting river in Sequoia National Forest (USFS 1991a). Both the Middle and South Forks flow through extensive and spectacular glacial canyons. All of the Middle Fork is within designated wilderness, as is the upper portion (24.1 miles) of the South Fork. The lower segment of the South Fork canyon is known as the Kings Canyon, giving the park its name (NPS 2007). The Kings Canyon, including the Cedar Grove developed area, is the only segment of the Kings River accessible by motor vehicle and has been classified as a recreational river.

Scenic river areas are those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

Recreational river areas are those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

Regardless of classification, each river in the National System is administered with the goal of protecting and enhancing the values that caused it to be designated.

Under the Wild and Scenic Rivers Act, outstandingly remarkable values (ORVs) are defined as those resources that are river-related and rare, unique, or exemplary in a regional or national context. The lower segment of the South Fork of the Kings River, which includes the Cedar Grove area has the following ORVs: scenic, recreational and geologic (NPS 2007).

The lower segment of the South Fork of the Kings River is 7.6 miles long. The river corridor boundary extends 0.25 mile on each side of the river. This recreational river segment flows through the floor of the Kings Canyon. The area is open seasonally, typically from May through October. There are limited areas of development, managed river-based recreation, and defined river access points. The use of flotation devices, boats, or rafts is prohibited on the South Fork of the Kings River from Bubbs Creek Bridge downstream to the Kings Canyon National Park boundary (Superintendent’s Compendium 2008). Regular inspection of the condition of resources, including the river’s outstandingly remarkable values is required. Hiking and other forms of recreation, such as fishing, picnicking, and bicycle use are allowed within the river corridor (NPS 2007), pursuant to existing regulations.

FLOODPLAINS

Much of the parks encompass steep, upper watersheds that would limit the extent of floodplains. However, portions of the Cedar Grove developed area are potentially subject to flooding from the South Fork of the Kings River. Cedar Grove is in a relatively broad portion of the lower valley of the South Fork of the Kings River. The Cedar Grove Village Lodge and store are within the 100-year

floodplain. Park facilities downstream of the Cedar Grove Bridge are also potentially in the floodplain (NPS, Austin, pers. comm. 2009). The portion of the Sentinel Campground closest to the river is within the floodplain, as are sections of roads within the canyon (NPS 2007).

Peak spring runoff, fed by melting snowpack, typically occurs in late spring through early summer. Winter flooding is associated with heavy warm rains falling on snowpack and is characterized by a large volume of runoff occurring in a relatively short time frame (NPS 2007).

WETLANDS

According to Cowardin et al. (1979) and the U.S. Army Corps of Engineers (ACOE) criteria, the Kings River is considered a wetland because it includes, "all wetlands and deepwater habitats contained within a channel..." A channel is "an open conduit either naturally or artificially created which periodically or continuously contains moving water, or which forms a connecting link between two bodies of standing water" (Langbein and Iseri 1960:5).

Wetland vegetation in the project area consists mainly of willow growing on the gravel/cobble bar that has developed between the side channel and the main channel of the river. Willow species (*Salix* spp.) and more specifically, Scouler's willow (*Salix scouleriana*), were identified in the proposed project area (Haultain 2009). Additional wetland species, such as black cottonwood (*Populus balsamifera L.* ssp. *trichocarpa* and white alder (*Alnus rhombifolia*) were also identified in the proposed project area (Haultain 2009).

VEGETATION AND NON-NATIVE SPECIES

The project area was surveyed to determine the presence of rare species and to inventory plant species and vegetation that could be impacted by proposed project. Forty-nine vascular plant taxa, including such common species as canyon live oak (*Quercus chrysolepis* Liebm.), California black oak (*Quercus kelloggii*), whitebark raspberry (*Rubus leucodermis*), white sagebrush (*Artemisia ludoviciana*), aster (*Aster* sp.), brome (*Bromus* sp.), were observed in the field (Haultain 2009). No special status species were observed. This survey should not be considered an exhaustive list.

One of the primary vegetation stressors in the park is the introduction of invasive non-native plant species (NPS 2007). There are several non-native plant populations in the Cedar Grove area, including bull thistle (*Cirsium vulgare*), wooly mullein (*Verbascum thapsus*), cheatgrass (*Bromus tectorum*), and bur buttercup (*Ranunculus testiculatus*). All of these species are present at or near the storage yard, which is being proposed as a staging area. Yellow star thistle (*Centaurea solstitialis*) has not been detected in Cedar Grove but 854 yellow star thistle plants were removed from the Convict Flat campground by the USFS in 2008 (USFS, Cordes, pers. comm. 2009). It has been determined by the parks botanist that the material needed for this project is not near the former occurrence

of yellow star thistle, so the extraction of this material would be allowed for use on the proposed project.

WILDLIFE

Sequoia and Kings Canyon National Parks are known to include 264 native vertebrate terrestrial species, and an additional 25 species may be present. This includes 5 species of amphibians, 21 species of reptiles, 168 species of birds, and 70 species of mammals. Of the native vertebrates, five species have been extirpated and 126 species are rare or uncommon (NPS 2007). Animals that are common in and around the project area includes common raven (*Corvus corax*) Steller's jay (*Cyanocitta stelleri*), American dipper (*Cinclus mexicanus)*, white-breasted nuthatch (*Sitta carolinensis*), American robin (*Turdus migratorius*), sharp-shinned hawk (*Accipiter striatus*) black bear (*Ursus americanus*), western fence lizards (*Sceloporus occidentalis*), Western rattlesnake (*Crotalus viridis*, mountain kingsnake (*Lampropeltis zonata*), Pacific chorus frog (*Pseudacris regilla*) and small mammals, such as northern flying squirrels (*Glaucomys sabrinus*), spotted skunk (*Spilogale gracilis*) and deer mice, and native rainbow trout (*Oncorhynchus mykiss*).

VISITOR EXPERIENCE, HEALTH AND SAFETY

Sequoia and Kings Canyon National Parks are located in south-central California and are within easy driving distance of two major metropolitan regions of California, approximately 240 miles north of Los Angeles and 240 miles southeast of San Francisco. Fresno is about 55 miles west of the Big Stump entrance to Kings Canyon National Park on Highway 180, and Visalia is about 35 miles west of the Ash Mountain entrance to Sequoia National Park on Highway 198.

Approximately 1.6 million people visited the parks in 2006. In the past 30 years annual visitation has fluctuated between a low of 1.4 million in 2000 to a high of 2.2 million in 1987 and 1991 (BRW, Inc. and Lee Engineering 1999). Visitors to the parks come primarily from within a 200-300 mile radius of the parks. The primary mode of transportation to the parks is the private automobile. Visitation tends to be weekend-oriented, peaking on extended weekends in the summer. July and August are the peak months with visitation dropping off dramatically during the winter months. About 80% of the annual visitation occurs from May through October. Parkwide, front country areas (about 2.5% of the parks' total area) receive around 98% of visitor use, with the wilderness receiving the remaining 2%.

The Kings Canyon is open generally from late April through November, based on weather, and is closed to vehicular traffic during the winter season. The developed area includes a NPS visitor center; park administrative, maintenance, and housing area; and NPS campgrounds, picnic areas, and trailheads. Concessioner-operated facilities include a lodge, gift shop, restaurant, administrative facilities, and packstation (generally open mid-May through mid-October). The road terminus is Roads End, where there is a wilderness permit station and access to several wilderness trailheads.

There are seven frontcountry campgrounds in Kings Canyon with over 113,000 overnight stays in 2000. Cedar Grove has been designated as a front country zone (NPS 2007). There are three front country campgrounds in the Cedar Grove area. In 2000 Canyon View campground had over 5,900 group overnight stays, Moraine campground had over 4,100 overnight stays and more than 700 RV stays, and Sentinel campground had over 17,200 overnight stays and 6,100 RV overnight stays (NPS 2007).

Recreational fishing occurs in the South Fork of the Kings River. Fishing is highly regulated and it is not supported by any facilities. Recreational fishermen have been observed regularly fishing above and below the Cedar Grove Bridge.

Other activities in the area include hiking on frontcountry and wilderness trails, bicycling on park roads, scenic viewing, wildlife watching, and swimming and wading in the river.

NPS *Management Policies 2006* state that the enjoyment of park resources and values by the people of the United States is part of the fundamental purpose of all parks and that the NPS is committed to providing appropriate high-quality opportunities for visitors to enjoy the parks. Part of the purpose of the parks is to offer opportunities for recreation, education, inspiration, and enjoyment. Consequently, one of the parks' management goals is to ensure that visitors safely enjoy and are satisfied with the availability, accessibility, diversity, and quality of park facilities, services, and appropriate recreational opportunities.

Public health and safety refers to the ability of the NPS to provide a healthy and safe environment for visitors and employees, and to protect human life and provide for injury-free visits and appropriate responses when accidents and injuries occur. The Cedar Grove Bridge was constructed in 1939 and has a very low load capacity that does not comply with the AASHTO weight standards. Due to degradation of the bridge, its current capacity is 7 tons (FHWA 2005). Park and concessions personnel, and visitors use the bridge to access portions of the park for visitor services, maintenance, law enforcement, search and rescue, and a variety of recreational and administrative purposes.

ENVIRONMENTAL CONSEQUENCES

This chapter analyzes both the beneficial and adverse impacts that would result from the implementation of the alternatives considered in this environmental assessment. It is organized by impact topics that were derived from internal park and external public scoping. This chapter includes definitions of impact thresholds, methods used to analyze impacts, and the analysis methods used for determining cumulative impacts. Impacts are evaluated based on context, duration, intensity, and whether they are direct, indirect, or cumulative impacts. NPS policy also requires that impairment of resources be evaluated in all environmental documents.

METHODOLOGY

This section contains the environmental impacts, including direct and indirect effects and their significance to the alternatives. The analysis is based on the assumption that the mitigation identified in the *Mitigation* section of this environmental assessment would be implemented under any of the applicable alternatives.

Impacts are evaluated based on the most current and comprehensive scientific and social data available. Overall, the NPS based these impact analyses and conclusions on the review of existing literature and studies; information provided by experts at the park and other agencies; professional judgment and park staff insights; input from interested local American Indian tribes; and public input. Impacts can be beneficial or adverse. Beneficial impacts would improve resource conditions while adverse impacts would deplete or negatively alter resources.

Definitions of intensity may vary by resource. Therefore, the definitions for each impact topic are described separately. These definitions were formulated through the review of existing laws, policies and guidelines, and with assistance from park, region and Washington office specialists. In all cases the impact thresholds are defined for adverse impacts. Beneficial impacts are addressed qualitatively. There are, however, several terms used within the environmental consequences section to assess the impacts of each alternative on each impact topic. Unless otherwise stated, the standard definitions for these terms are:

Localized Impact - the impact occurs in a specific site or area. When comparing changes to existing conditions, the impacts are only detectable in the localized area.

Short-term - the impact occurs only during or immediately after the actual management or project activity.

Long-term - the impact could occur for an extended period of time after the project activity has been completed. The impact could last several years or more.

Direct – an effect that is caused by an action that occurs at the same time and in the same place.

Indirect – an effect that is caused by an action that is later in time or farther removed in distance, but is still reasonably foreseeable.

CUMULATIVE EFFECTS

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 nonfederal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative effects can result from individually minor, but collectively significant, actions taking place over a period of time. The CEQ regulations that implement NEPA (1969) (42 U.S.C. 4321 et seq.), require assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are presented at the end of each impact topic discussion.

Methods for Assessing Cumulative Effects

To determine potential cumulative effects, actions and land uses were identified that have occurred, are occurring or are reasonably expected to occur near the project area. This project would occur in the Cedar Grove portion of Kings Canyon National Park. The project is in a deep canyon with limited access. There is only one access road into the Cedar Grove portion of Kings Canyon, and two public roads within the Cedar Grove portion of the park (not including campground roads and other smaller roads to facilities).

Potential future actions were determined by reviewing the plans and activities of the parks and Sequoia National Forest/Giant Sequoia National Monument, which is located downstream of the Cedar Grove Bridge. These actions were then assessed in conjunction with the impacts of the alternatives to determine if they would have any added adverse or beneficial effects on a particular natural resource, park operation, or visitor use. The evaluation of cumulative effects was based on available information of the actions. Cumulative effects are considered for each of the alternatives and are presented at the end of each impact topic discussion.

Past Actions

Past actions include activities that influenced and affected the current conditions of the environment near the project area. These actions primarily include disturbances to the landscape around the Cedar Grove Bridge, Cedar Grove Village, and along the Kings Canyon Scenic Byway, such as maintenance and repair of the bridge, park and concessioner facilities and the Kings Canyon Scenic Byway. These past actions contributed to both short- and long-term disturbances to the existing quality of the natural environment. The following past actions were identified near the project area.

Development of the Cedar Grove Area for Public Use

This includes the construction of concessioner and park facilities, trails, roads and removal of vegetation in the early to mid-20th century. The Kings Canyon Scenic Byway was also established and is managed by Hume Lake Ranger District of Sequoia National Forest/Giant Sequoia National Monument.

Construction of Bridges on the South Fork of the Kings River.

The Lower South Fork of the Kings River Bridge (hereinafter referred to as the Lower Bridge) was constructed 1950. The bridge has concrete abutments, two piers, a gauging station, and utilities within the bridge structure. The Cedar Grove Bridge was constructed in 1939. This bridge has concrete abutments and one pier. The west abutment was armored with riprap in 1997. The Upper South Fork of the Kings River Bridge (hereinafter referred to as the Upper Bridge) was constructed in 1953. The bridge has concrete abutments and one pier. None of the abutments or piers on the upper and lower bridges is armored with riprap.

Maintenance of Existing Roads, Bridges, and Facilities.

The Cedar Grove Bridge has had periodic maintenance to fix the sidewalk/catwalk and wooden decking, to patch holes, and to reconstruct the rail along the road shoulder. Minor work occurred in the stream channel in 1982 and major repairs occurred in 1997.

The Kings Canyon Scenic Byway, adjacent to the South Fork of the Kings River is managed by Hume Lake Ranger District of Sequoia National Forest/Giant Sequoia National Monument. There are various structures and facilities along the road, including a cave open to visitors, trailheads, and parking areas. The road has been protected in many areas by riprap.

Emergency Repairs of Bridges and Roads Due to Past Flooding.

The Cedar Grove area has experienced at least nine very large flood events in the past 70 years (1937, 1950, 1955, 1966, 1969, 1978, 1982, 1984, and 1997). During the 1997 flood event log jams formed at both the upper and lower bridges. Park staff removed the debris threatening the bridge piers. In addition, the west abutment of the Cedar Grove Bridge was damaged, the water line under the bridge was broken, and the sewer line was exposed. Park staff reconstructed the western approach to the bridge and armored the abutment.

Current and Future Actions

The following current and reasonably foreseeable future actions were considered in the cumulative effects analysis. Ongoing activities that have the potential to affect resources include the ongoing maintenance of existing roads, bridges, facilities (asphalt patching, striping, painting bridge rails) and general wear and tear from visitor use.

Other activities include roadside brushing, culvert flushing and cleaning, and road striping (cyclic every 2 to 5 years). Chipsealing the road is planned for 2010. Work would occur in June/July 2010 and

would be timed to avoid the bridge project, but there may be some overlap. Utility maintenance projects may also occur. These projects are usually done during the shoulder seasons.

The Canyon View campground upstream from the Cedar Grove Bridge is scheduled to be rehabilitated in 2010. This project would include repairing the road and campsites to improve the facilities and visitor experience. This project is scheduled for the fall to reduce impacts on visitors. Since the project would be completed outside the visitor use season, there would be little effects to the visitor except for an improved campground and experience when the project is completed.

The implementation of all future projects is contingent on receiving adequate funding.

IMPAIRMENT OF SEQUOIA AND KINGS CANYON NATIONAL PARKS RESOURCES OR VALUES

In addition to determining the environmental consequences of the preferred and other alternatives, the 2006 NPS *Management Policies* and *DO-12* require analysis of potential effects to determine if actions would impair Sequoia and Kings Canyon National Parks 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. NPS managers must always seek ways to avoid or minimize, to the greatest degree practicable, adverse impacts on park and monument resources and values. However, the laws do give NPS management discretion to allow impacts on 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.

The prohibited impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including opportunities that otherwise would be present for the enjoyment of those resources or values. An impact would more likely constitute impairment when it has a major or severe adverse effect upon 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 to opportunities for enjoyment of the park; and
- identified as a goal in the Sequoia and Kings Canyon National Parks FGMP/EIS or other relevant NPS planning documents.

Impairment may result from NPS activities in managing the park, visitor activities, or activities undertaken by concessioners, contractors, and others operating in the park. The “Environmental Consequences” section includes a determination on impairment in the

conclusion statement of each impact topic for each alternative. Impairment statements are not required for visitor experience and health and safety.

UNACCEPTABLE IMPACTS

The impact threshold at which impairment occurs is not always readily apparent. Therefore, the NPS applies a standard that offers greater assurance that impairment will not occur. The NPS does this by avoiding impacts that it determines to be unacceptable. These are impacts that fall short of impairment, but are still not acceptable within a particular park's environment. Therefore, for the purposes of these policies, unacceptable impacts are impacts that, individually or cumulatively, would:

- be inconsistent with a park's purposes or values or
- impede the attainment of a park's desired future conditions for natural and cultural resources as identified through the park's planning process or
- create an unsafe or unhealthful environment for visitors or employees or
- diminish opportunities for current or future generations to enjoy, learn about or be inspired by park resources or values or
- unreasonably interfere with park programs or activities or
    - an appropriate use or
    - the atmosphere of peace and tranquility, or the natural soundscape maintained in wilderness and natural, historic, or commemorative locations within the park
    - NPS concessioner or contractor operations or services.

A determination on unacceptable impacts is made in the conclusion statement of each impact topic for each alternative in the "Environmental Consequences" section.

ENVIRONMENTAL CONSEQUENCES

Water Quality

Impact Intensity and Description

Negligible:	The impact would be at the lower levels of detection or not measurable.
Minor:	Changes in water quality, such as increased turbidity, would not exceed water quality standards and would be within a few hundred yards of construction.
Moderate:	Changes in water quality, such as increased turbidity, would approach water quality standards and would be limited to within a few hundred yards of construction.

Major: Changes in water quality, such as increased turbidity, would exceed water quality standards and would occur on a regional or watershed scale.

ALTERNATIVE A: NO ACTION

Under the no action alternative, the NPS would continue management actions that would include minor repairs of the bridge, such as armoring the abutments. The bridge would continue to deteriorate and maintenance activities after high flow events may be needed. As described above, high flow is defined as anything greater than the ordinary high water mark (OHWM). The two-year flood delineation is being used as a rough estimate of the OHWM for this project. A two-year flood is the level of flood water expected to be equaled or exceeded every two years on average.

Erosion of the west bank from high flow events and the maintenance activities required to address the erosion would cause increased turbidity and conductivity affecting water quality. There would be local, short-term, minor, adverse impacts on water quality due to erosion of the west bank and also maintenance of the bridge resulting from high flow events.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions with the potential to affect water quality include ongoing road and bridge maintenance, runoff from the road and parking lot, and emergency stabilization of the bridge, abutments, and bank. These actions have the potential to affect water quality by increasing erosion, which would increase turbidity and conductivity, resulting in short-term, negligible to minor, adverse impacts on water quality. The no action alternative would contribute slightly to the overall short-term adverse, cumulative effects on water quality as these activities would continue in the future under this alternative. The overall cumulative impacts on water quality from past, present, and reasonably foreseeable future projects, in combination with the impacts of the no action alternative would be short-term, minor, and adverse.

Conclusion. Under the no action alternative, there would be local, short-term, minor, adverse impacts due to continued erosion of the west bank and ongoing maintenance activities. The no action alternative would contribute slightly to these effects, resulting in short-term, minor, adverse, cumulative impacts on water quality.

Because there would be no major, adverse impacts on water quality, there would be no impairment of park resources and values. Because the impacts previously described (1) are not inconsistent with the park’s purpose and values, (2) do not prevent the attainment of desired future conditions for natural and cultural resources, (3) do not create an unsafe environment, (4) do not diminish opportunities for future enjoyment of the park, and (5) do not unreasonably interfere with park programs or activities, an appropriate use, or concessioner or contractor operations, there would be no

unacceptable impacts on water quality under the no action alternative.

ALTERNATIVE B: MANAGEMENT PREFERRED ALTERNATIVE

Impact of existing bridge removal

Under the management preferred alternative, the removal of the steel beams below the bridge deck, abutments, wingwalls, and piers would require use of heavy equipment in the stream, disturbing the streambed. For stationary equipment a temporary riprap pad would be installed in the stream channel for increased stability and to minimize streambed disturbance. The traversing of the streambed by heavy equipment and the installation of the riprap pad and removal of the west side embankment would likely generate short-term erosion and sediment transport, increasing turbidity in the stream.

Impact of new bridge construction

The construction of both piers would require excavation of material, disturbing the streambed. The construction of the west side abutment, wingwall, and riprap would cause disturbance to the streambed and on the stream bank, which would also likely generate short-term erosion and sediment transport, increasing turbidity and conductivity in the stream.

Bridge protection and river restoration

The excavation of the depositional area, relocation of the material to the highly-eroded area along the west bank of the river, and installation of the reinforced floodplain would also cause disturbance to the stream bed and the stream bank, which would also likely generate short-term erosion and sediment transport, increasing turbidity and conductivity in the stream. Heavy equipment would be operated slowly and carefully to minimize movement of stream sediment and increased turbidity downstream. In addition, all equipment would be carefully inspected before entering the channel to ensure cleanliness and that fuel or lubricants are not visible on the outside of the equipment and would not leak during use of the equipment in the channel. Work areas would be isolated from the main channel flow through the use of water-inflated cofferdams or similar structure to reduce turbidity. Turbid water from within the work site would be pumped to high ground on the west bank where the topography is naturally flat with depressions and contained to infiltrate.

Spills of fuel, cement, or other products associated with bridge construction and the restoration could enter the stream channel. BMPs outlined in the mitigation measures section would be implemented to prevent spills from entering the South Fork of the Kings River, prevent sediment transport downstream, and minimize water quality impacts on the South Fork of the Kings River. After construction is completed, the disturbed areas would be revegetated and stabilized as soon as possible.

The additional freeboard of the new bridge would also better protect the sewer and other utilities from flood impacts, lessening the potential for a spill, which would adversely impact water quality, during floods.

Based on analysis of the impacts described above, the in-stream work during the replacement of the bridge and the river restoration would result in short-term, moderate, adverse impacts on water quality. However, overtime, the stabilization of the river bank resulting from the restoration work would decrease erosion and reconnect the river with the existing floodplain downstream of the bridge. During high water events, sediment would be deposited on the floodplain, reducing the potential for bridge damage and spills (sewer) during flood events, and would result in long-term, beneficial effects on water quality.

Cumulative Impacts. As stated above, past, present, and reasonably foreseeable future actions with the potential to affect water quality include road and bridge maintenance, runoff from the road and parking lot, and emergency bridge protection measures. These actions could result in increased erosion and short-term, negligible to minor, adverse impacts on water quality. The management preferred alternative would result in short-term moderate adverse effects during construction, but would also result in a long-term, beneficial effect on water quality by increasing the floodplain area, protecting the bridge and utility lines from future damage, and allowing more infiltration through the creation of a wood reinforced floodplain. Therefore, the overall cumulative impacts on water quality from past, present, and reasonably foreseeable future projects, in combination with the impacts of the management preferred alternative would be short- and long-term, minor to moderate, beneficial and adverse.

Conclusion. The management preferred alternative would have short-term, moderate, adverse impacts on water quality from replacement of the bridge and the river restoration work. However, there would also be long-term, beneficial impacts on water quality from stabilization of the river banks and the restoration project. Cumulative effects to water quality would be short- and long-term, minor to moderate, beneficial and adverse.

Because there would be no major, adverse impacts on water quality, there would be no impairment of park resources and values. Because the impacts previously described (1) are not inconsistent with the park’s purpose and values, (2) do not prevent the attainment of desired future conditions for natural and cultural resources, (3) do not create an unsafe environment, (4) do not diminish opportunities for future enjoyment of the park, and (5) do not unreasonably interfere with park programs or activities, an appropriate use, or concessioner or contractor operations, there would be no unacceptable impacts on water quality under the management preferred alternative.

Hydrology and Stream flow Characteristics

Impact Intensity and Description

Negligible:	An action that would result in a change to stream flow characteristics, but the change would be so small that it would not be of any measurable or perceptible consequences.
Minor:	An action that would result in a change in a singular stream flow characteristic, but the change would be small, localized, and of little consequence.
Moderate:	An action that would result in a change to a stream flow characteristic; the change would be measurable and of consequence.
Major:	An action that would result in a noticeable change to a stream flow characteristic, the change would be measurable and result in a severely adverse or major, beneficial impact with regional consequences.

ALTERNATIVE A: NO ACTION

Under the no action alternative, the NPS would continue ongoing actions such as regular bridge maintenance. The existing bridge would continue to restrict stream flow and alter the natural hydrology of the river because the bridge is not an adequate length and thus creates a constricted stream channel. This increases erosion of the river banks, changing the configuration of the river channel, resulting in long-term, moderate, adverse impacts on hydrology and stream flow characteristics.

High flow or flood events could damage the bridge piers and abutments, resulting in extensive repair work, which could include rebuilding the abutments; bank armoring; or reinforcing and/or replacing bridge piers. This would result in short- and long-term, minor to moderate adverse impacts on hydrology and stream flow in the vicinity of the bridge.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions with the potential to affect hydrology and stream flow characteristic include road and bridge maintenance activities, such as adding riprap and removing accumulating sediment and debris, and taking emergency action to stabilize the bridge abutments and river banks. These actions result in short- and long-term, minor to moderate adverse impacts on hydrology and stream flow characteristics. Under the no action alternative, these activities would likely continue in the future and may increase if flows increase as a result of changing conditions (e.g. climate change). The overall cumulative impacts on hydrology and stream flow characteristics, in combination with the impacts of the no action alternative would be long-term moderate and adverse.

Conclusion. Under the no action alternative, the existence of the bridge has resulted in long-term moderate adverse effects to hydrology and stream flow characteristics because it is not adequately sized to allow for natural flows. Future maintenance and

repair work after high water events would result in short- and long-term, minor to moderate adverse impacts on hydrology and stream flow in the vicinity of the bridge.

The overall cumulative impacts on hydrology and stream flow characteristics, in combination with the impacts of the no action alternative would be long-term moderate and adverse.

Because there would be no major, adverse impacts on water quality, there would be no impairment of park resources and values. Because the impacts previously described (1) are not inconsistent with the park's purpose and values, (2) do not prevent the attainment of desired future conditions for natural and cultural resources, (3) do not create an unsafe environment, (4) do not diminish opportunities for future enjoyment of the park, and (5) do not unreasonably interfere with park programs or activities, an appropriate use, or concessioner or contractor operations, there would be no unacceptable impacts on water quality under the management preferred alternative.

ALTERNATIVE B: MANAGEMENT PREFERRED ALTERNATIVE

Impact of existing bridge removal

Under the management preferred alternative, the removal of the steel beams below the bridge deck, abutments, wingwalls, and piers would require the temporary diversion of the stream on each side of the channel below the bridge. These impacts would be short-term, localized at the bridge site, minor to moderate and adverse.

Impact of new bridge construction

Similar to the impacts described above for the bridge removal, the construction of the new bridge would require the temporary diversion of the river. Once the longer bridge is constructed, the river would flow more naturally than the previous conditions. The bridge cross section would be wider than the existing channel section immediately downstream of the bridge, which would remove the majority of the flow constriction, except for the bridge piers. This would allow for a more free-flowing condition as well as passage of a 100-year flood.

Bridge protection and river restoration

During the construction of the wood reinforced floodplain, the river would be diverted and impacts on hydrology and stream flow characteristics would be short-term, minor and adverse due to the manipulation of the channel and the presence of heavy equipment. Work would be conducted during low flow periods, and mitigation would be imposed to minimize potential adverse effects. In the long-term, the excavation of the depositional area, relocation of materials to the highly-eroded area along the west bank of the river, and installation of the reinforced floodplain would stabilize the river bank, protect the existing floodplain downstream of the bridge location, increase channel roughness to reduce flow velocities, and realign the channel to a more natural course (FHWA

2006a). This would result in long-term beneficial effects to the stream flow and hydrology in the vicinity of the project area.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions with the potential to affect hydrology and stream flow characteristic include road and bridge maintenance activities, such as adding riprap and removing accumulating sediment and debris, and taking emergency action to stabilize the bridge abutments and river banks. These actions result in short- and long-term, minor to moderate adverse impacts on hydrology and stream flow characteristics. The management preferred alternative would result in additive effects in the short-term from the removal and construction of the bridge, and the construction of the wood reinforced floodplain. However, in the long-term, effects on the stream flow and hydrology would be beneficial because the longer bridge would allow for more natural flows, and the wood reinforced floodplain would stabilize the river flows and improve the hydrologic function. Therefore, the overall cumulative impacts on hydrology and stream flow characteristics, in combination with the impacts of the management preferred alternative would be short-term, minor to moderate and adverse, and long-term and beneficial.

Conclusion. The management preferred alternative would have short-term, minor to moderate, adverse impacts on hydrology and stream flow characteristics from construction and the river restoration work. There would be long-term, beneficial impacts on hydrology and stream flow characteristics resulting from the replacement of the existing bridge with a longer bridge and the implementation of the restoration project. Cumulative effects would be short-term, minor to moderate and adverse, as well as long-term and beneficial.

Because there would be no major, adverse impacts on hydrology and stream flow characteristics, there would be no impairment of park resources and values. Because the impacts previously described (1) are not inconsistent with the park's purpose and values, (2) do not prevent the attainment of desired future conditions for natural and cultural resources, (3) do not create an unsafe environment, (4) do not diminish opportunities for future enjoyment of the park, and (5) do not unreasonably interfere with park programs or activities, an appropriate use, or concessioner or contractor operations, there would be no unacceptable impacts on hydrology and stream flow characteristics under the management preferred alternative.

Wild and Scenic Rivers

Impact Intensity and Description

Negligible:	Impacts would be barely detectable to most visitors and would have no discernible effect on a river's free-flowing character and ORVs.
Minor:	Impacts would be slightly detectable to some visitors but are not expected to have an overall effect on a river's free-flowing character and ORVs.
Moderate:	Impacts would be clearly detectable by many visitors

	and could have an appreciable effect on a river's free-flowing character and ORVs.
Major:	Impacts would have a substantial and noticeable effect on most visitors or the river's free-flowing character and ORVs.

ALTERNATIVE A: NO ACTION

Impacts on free-flowing character

Under the no action alternative, the existing bridge would continue to restrict stream flow and alter the natural hydrology of the river because the bridge is not an adequate length and thus creates a constricted stream channel. The NPS would continue management actions that would include regular maintenance of the bridge and approach roads.

High flow or flood events could cause temporary or permanent damage to the bridge piers and abutments. This could result in a need for repair work including rebuilding the abutments; bank armoring; and armoring, reinforcing and/or replacing bridge piers. This would result in local, short-term, minor to moderate, adverse impacts on the free-flowing character of the river. The impacts of the continued erosion of the river banks from the continuing constriction of the river channel could further change the configuration of the river channel, resulting in long-term, moderate, adverse impacts on the free-flowing character of the river.

Impacts on ORVs

Scenic

The existing bridge causes a long-term, moderate, adverse impact on the scenic ORV of the river. This effect is localized and does not have a segment-wide effect. After high flow events maintenance of the eroded river bank and the bridge abutments may be required causing localized impacts on the river's scenic ORV. These impacts would be short- and long-term, minor and adverse and would not intrude on or unreasonably diminish the scenic ORV.

Geologic Processes/Conditions

After high flow events, maintenance of the eroded river bank and the bridge abutments may be required causing local impacts on the river's geologic ORV. Given that the channel is largely gravel and cobbles, the potential use of heavy equipment in the stream would likely alter the channel bottom only slightly in the sections it traverses. This effect would be localized, negligible and adverse, and would not have a segment-wide effect.

Recreation

Periodic bridge maintenance would continue to be conducted, particularly after high flow events. This may cause localized impacts on the river's recreation ORV resulting from noise

disturbance and temporary access restrictions. The impacts would be localized, short-term, negligible and adverse.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions with the potential to affect the river include road and bridge maintenance and emergency protective measures, such as stabilization of the west bank. These actions have the potential to affect the free-flowing character and ORVs of the river by the continued constriction of the river channel, increasing erosion of the west bank, compacting the river bed during any potential in-stream work, and limiting recreational access to the river at the project area during maintenance activities. The existence of other bridges on the designated wild and scenic river corridor, along with the past placement of riprap on the road corridor outside of the park boundary have resulted in long-term, minor to moderate, adverse impacts on the river' ORVs and free-flowing character on a localized scale along the river corridor adjacent to the roadway. The no action alternative would contribute slightly to the cumulative effects because there is a high likelihood that future repairs and emergency maintenance would be required, resulting in short- and long-term, moderate adverse cumulative effects to the river ORVs and free-flowing character.

Conclusion. Under the no action alternative there would continue to be long-term, moderate, adverse impacts on the free-flowing character of the river and short- and long-term minor adverse impacts on the scenic ORV. There would be localized, short-term negligible adverse impacts on the river's geologic and recreation ORVs after high flow events due to maintenance and emergency activities. The no action alternative would contribute slightly to the cumulative effects because there is a high likelihood that future repairs and emergency maintenance would be required resulting in short- and long-term, moderate adverse cumulative effects to the river ORVs and free-flowing character.

Because there would be no major, adverse impacts on wild and scenic rivers, there would be no impairment of park resources and values. Because the impacts previously described (1) are not inconsistent with the park's purpose and values, (2) do not prevent the attainment of desired future conditions for natural and cultural resources, (3) do not create an unsafe environment, (4) do not diminish opportunities for future enjoyment of the park, and (5) do not unreasonably interfere with park programs or activities, an appropriate use, or concessioner or contractor operations, there would be no unacceptable impacts on wild and scenic rivers under the management preferred alternative.

ALTERNATIVE B: MANAGEMENT PREFERRED ALTERNATIVE

Pursuant to the Wild and Scenic Rivers Act, the NPS has prepared a Section 7(a) determination on all proposed water resources projects on a wild and scenic river (Appendix D). The Section 7(a) determination process applies only to the proposed action; as a result, the management preferred alternative is the only alternative analyzed in the Section 7(a) determination. The following section is a summary of the Section 7(a) determination.

Impacts on free-flowing character

Impact of existing bridge removal

Under the management preferred alternative, the removal of the steel beams below the bridge deck, abutments, wingwalls, and piers would require the temporary diversion of the river on each side of the channel upstream and below the bridge. These measures would temporarily restrict flow, resulting in short-term, moderate adverse impacts on the free-flowing character of the river.

Impact of new bridge construction

The construction of the new bridge would require the temporary diversion of the river, reducing its free-flowing nature as stated above. After construction is completed, the bridge cross section would be wider than the existing channel section, which would remove the majority of the flow constriction, except for the bridge piers. This would allow for a more free-flowing condition than the previous conditions as well as passage of a 100-year flood, resulting in long-term beneficial effects in the project area.

Bridge protection and river restoration

During the restoration project, the river would be diverted as described above. Construction would occur during low flow, and mitigation would further reduce impacts. The excavation of the depositional area, relocation of the material to the highly-eroded area along the west bank of the river, and installation of the reinforced floodplain would stabilize the river bank, protect the existing floodplain downstream of the bridge location, increase channel roughness to reduce flow velocities, and realign the channel to a more natural course (FHWA 2006a).

The in-stream work during the existing bridge removal, new bridge construction, and bridge protection and river restoration would result in short-term, moderate adverse impacts on the free-flowing character of the river, and long-term, beneficial effects to the free-flowing character due to the replacement of the existing bridge with a longer bridge. The longer bridge would allow the river to flow more freely through the bridge section than the existing bridge. The reinforced floodplain would have a long-term beneficial effect by restoring natural hydrologic processes in the river.

Impacts on ORVs

Scenic

Impact of existing bridge removal

The removal of the existing bridge would cause local impacts on the river's scenic ORV from construction disturbance in the project area. These impacts would be local, short-term, minor to moderate, and adverse. Because these impacts would be short-term, they would not intrude on or unreasonably diminish the scenic ORV present in the area once the project is completed.

Impact of new bridge construction

The construction of the new bridge would cause local, short-term, minor to moderate, adverse impacts on the river's scenic ORV from construction disturbance. The new bridge is larger and more complex than the existing bridge, causing a long-term, moderate, adverse impact on the scenic ORV of the river. This effect would be localized and would not have a segment-wide effect. Though the effect would be adverse, it would not intrude on or unreasonably diminish the scenic ORV present in the area because it is replacing an existing bridge, and would be offset by the improved free-flow of the river resulting from the project.

Bridge protection and river restoration

The protection of the bridge and installation of the reinforced floodplain would cause local, short-term, minor to moderate, adverse impacts on the river's scenic ORV from construction disturbance. To minimize long-term adverse impacts, the abutment slopes would be covered with material that would be similar to the existing cobble of the riverbed. The reinforced floodplain would serve to stabilize the river channel, and eliminate the eroded west bank. The disturbed area and reinforced floodplain would be revegetated, and would eventually (1 to 2 growing seasons) blend in with the surrounding landscape, and would result in long-term beneficial effects on the scenic ORV.

Geologic Processes/Conditions

Impact of existing bridge removal, new bridge construction, and bridge protection and river restoration

The removal of the existing bridge, the construction of the new bridge and bridge protection and river restoration would cause local impacts on the river's geologic ORV from construction disturbance around the project area. Given that the channel is largely gravel and cobbles, the use of heavy equipment would likely alter the channel bottom only slightly in the sections it traverses. The river banks would be revegetated upon completion of the construction. These impacts would be local, short-term, negligible adverse and would not intrude on or unreasonably diminish the geologic ORV.

Recreation

Impact of existing bridge removal, new bridge construction, and bridge protection and river restoration

The removal of the existing bridge, the construction of the new bridge and bridge protection and river restoration would cause local, short-term minor adverse impacts on the river's recreational ORV from bridge and instream closures related to construction at the project area. There would be other opportunities for visitors to continue to access the river outside the project limits.

The replacement of the bridge would provide a long-term, safe, durable, sustainable passage for vehicles, pedestrians, and bicycles crossing the South Fork of the Kings River at Cedar Grove Village providing a localized, long-term beneficial effect on recreation ORVs.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions with the potential to affect the river include past and future road and bridge maintenance, emergency stabilization, the existence of other bridges on the designated wild and scenic river corridor, and the past placement of riprap on the road corridor outside of the park boundary. These actions have affected the free-flowing character and ORVs of the river as stated under the no action alternative.

The management preferred alternative would result in short-term minor to moderate adverse effects on the free-flowing character and ORVs as a result of construction actions, but in the long-term, would result in beneficial effects to the free-flowing character and ORVs from an increased bridge span, reduced maintenance, and by restoring the natural hydrologic function of the river with the placement of the wood reinforced floodplain. However, some would argue the presence of any bridge on a wild and scenic river results in a minor to moderate adverse effect on the scenic ORV. Overall, the management preferred alternative would result in short-term moderate adverse cumulative effects and long-term moderate adverse and beneficial cumulative effects to the free flowing character and ORVs.

Conclusion. Based on the detailed impact analysis in the Section 7(a) determination (Appendix D), which is summarized above, the management preferred alternative would have short-term, moderate, adverse impacts on the free-flowing character and ORVs of the river from the project work. There would be long-term, moderate, adverse impacts on the scenic ORV from the continued existence of the bridge on the river. The management preferred alternative would result in localized, long-term, beneficial effects to the free-flowing condition of the river as a result of installing a longer bridge, and long-term beneficial effects on recreation ORVs by provide safe passage across the bridge. Cumulative effects would be short-term moderate adverse to the free flowing character and ORVs, and long-term moderate adverse and beneficial.

Because there would be no major, adverse impacts on wild and scenic rivers, there would be no impairment of park resources and values. Because the impacts previously described (1) are not inconsistent with the park's purpose and values, (2) do not prevent the attainment of desired future conditions for natural and cultural resources, (3) do not create an unsafe environment, (4) do not diminish opportunities for future enjoyment of the park, and (5) do not unreasonably interfere with park programs or activities, an appropriate use, or concessioner or contractor operations, there would be no unacceptable impacts on wild and scenic rivers under the management preferred alternative.

Floodplains

Impact Intensity and Description

Negligible:	There would be very little change in the ability of a floodplain to convey floodwaters or its values and functions. The proposed project would not contribute to flooding.
Minor:	Changes in the ability of a floodplain to convey floodwaters or its values and functions would be measurable and local, although the changes would be barely measurable. The proposed project would not contribute to flooding.
Moderate:	Changes in the ability of a floodplain to convey floodwaters or its values and functions, would be measurable and local. The proposed project could contribute to flooding.
Major:	Changes in the ability of a floodplain to convey floodwaters or its values and functions would be measurable and widespread. The proposed project would contribute to flooding.

ALTERNATIVE A: NO ACTION

Under the no action alternative, the NPS would continue to conduct regular maintenance and emergency repairs to the bridge as discussed previously. The bridge would still be located within the floodplain, and there would be no change in the ability of the floodplain to convey floodwaters.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions with the potential to affect the floodplain include the past construction and continued existence of park and concessioner facilities, including the Cedar Grove Bridge and the Cedar Grove Village, within the floodplain of the South Fork of the Kings River. These actions have affected the floodplain by filling in a portion of the floodplain and river channel causing flow restrictions, and have led to increased erosion on the west bank of the river. Also the presence of facilities within a floodplain reduces the potential for the floodplain to dissipate energy during high flow events and restricts the river's ability to flow freely. The presence of the facilities and continued maintenance has resulted in long-term,

moderate adverse impacts on the floodplain in and around the project area. Under the no action alternative, future maintenance and repairs would likely be required to the bridge and facilities, and could result in additive restrictions to flows and slight changes to the floodplain's current condition, resulting in short- and long-term minor adverse affects. Overall, cumulative effects to the floodplain are short- and long-term, moderate and adverse.

Conclusion. Under the no action alternative, there would be localized, short- and long-term negligible to minor adverse impacts on the floodplain. Cumulative impacts would be short- and long-term, moderate and adverse.

Because there would be no major, adverse impacts on floodplains, there would be no impairment of park resources and values. Because the impacts previously described (1) are not inconsistent with the park's purpose and values, (2) do not prevent the attainment of desired future conditions for natural and cultural resources, (3) do not create an unsafe environment, (4) do not diminish opportunities for future enjoyment of the park, and (5) do not unreasonably interfere with park programs or activities, an appropriate use, or concessioner or contractor operations, there would be no unacceptable impacts on floodplains under the management preferred alternative.

ALTERNATIVE B: MANAGEMENT PREFERRED ALTERNATIVE

Executive Order 11988 (Floodplain Management) requires an examination of impacts on floodplains and potential risks involved in placing facilities within floodplains. NPS Order #77-2: Floodplain Management states that a Statement of Findings (SOF) must be prepared and approved. The Floodplain SOF is found in Appendix E.

Impact of existing bridge removal

Under the management preferred alternative, the removal of the steel beams below the bridge deck, abutments, wingwalls, and piers would require the temporary diversion of the stream on each side of the channel below the bridge, but after construction is completed, it would flow more naturally than the previous conditions.

Impact of new bridge construction

Similar to the impacts described above for the bridge removal, the construction of the new bridge would require the temporary diversion of the stream, but below the bridge, after construction is completed, it would still flow more naturally than the previous conditions. The bridge cross section would be wider than the existing channel section immediately downstream of the bridge, which would remove the majority of the flow constriction, except for the bridge piers. This would allow for a more free-flowing condition than the previous conditions as well as passage of a 100-year flood.

Bridge protection and river restoration

The excavation of the depositional area, relocation of the material to the highly-eroded area along the west bank of the river, and

installation of the reinforced floodplain would stabilize the river bank, increase channel roughness to reduce flow velocities, and realign the channel to a more natural course (FHWA 2006a).

The management preferred alternative would have short-term, minor, adverse impacts on the floodplain from replacement of the bridge and the river restoration work. However, there would also be long-term, beneficial impacts on the floodplain due to the replacement of the existing bridge with a longer bridge, which would allow for a more free-flowing condition than existing conditions as well as 100-year flood flows and would be beneficial to floodplains.

Cumulative Impacts. As stated above, the past construction and continued existence of park and concessioner facilities, including the Cedar Grove Bridge and the Cedar Grove Village, within the floodplain of the South Fork of the Kings River have affected the floodplain by filling in a portion of the floodplain and river channel causing flow restrictions, and have led to increased erosion on the west bank of the river. Also the presence of facilities within a floodplain reduces the potential for the floodplain to dissipate energy during high flow events and restricts the river's ability to flow freely. The presence of the facilities and continued maintenance has resulted in long-term, moderate adverse impacts on the floodplain in and around the project area. The replacement of the existing bridge with a longer bridge would allow for a more free-flowing condition than existing conditions as well as 100-year flood flows and would be beneficial to floodplains. Periodic maintenance and the need for emergency bridge repairs should be reduced under this alternative due the increase bridge length and the capacity to handle 100-year flood flows. Overall this alternative would result in short-term adverse effects from construction activities within the floodplain, but, once project work is completed, result in long-term beneficial effects to the floodplain. Cumulative effects to the floodplain would be short- and long-term, minor and adverse, and long-term and beneficial.

Conclusion. The management preferred alternative would have short-term, minor, adverse impacts on the floodplain from replacement of the bridge and the river restoration work. However, there would also be long-term, beneficial impacts on the floodplain due to the replacement of the existing bridge with the longer bridge and the restoration project. Cumulative effects would be short- and long-term, minor, and adverse as well as long-term, beneficial.

Because there would be no major, adverse impacts on floodplains, there would be no impairment of park resources and values. Because the impacts previously described (1) are not inconsistent with the park's purpose and values, (2) do not prevent the attainment of desired future conditions for natural and cultural resources, (3) do not create an unsafe environment, (4) do not diminish opportunities for future enjoyment of the park, and (5) do not unreasonably interfere with park programs or activities, an appropriate use, or concessioner or contractor operations, there would be no

unacceptable impacts on floodplains under the management preferred alternative.

Wetlands

Impact Intensity and Description

Negligible:	The impact would be at the lower levels of detection or not measurable.
Minor:	The impact would be detectable, but it would be limited to a small area of the wetland and would not affect the viability of any local biotic population or overall community size, structure or composition.
Moderate:	The impact would be clearly detectable and could have an appreciable effect on wetlands or their biota in a localized area. This would include impacts that affect the abundance or distribution of local populations, but it would not affect regional wetlands or the viability of regional biotic populations. Localized changes to community size, structure or composition and ecological process would occur.
Major:	The impact would be severely adverse or exceptionally beneficial. Impacts would have a substantial, highly noticeable or widespread influence on multiple or extensive wetlands and affect the abundance or distribution of a local or regional population to the extent that the population would not be likely to recover (adverse) or would return to a sustainable level (beneficial). Community size, structure or composition and ecological processes would be highly altered, and landscape level changes could be expected.

Duration

Short term – temporary, and would be associated with construction activities as well as the period of site restoration.

Long term – occurs during and continues after the construction and site restoration period.

ALTERNATIVE A: NO ACTION

Under the no action alternative, the NPS would continue management actions including regular bridge maintenance. The existing bridge would continue to restrict stream flow and alter the natural hydrology of the river because the bridge is not an adequate length and thus creates a constricted stream channel reducing the amount of area available for the development of riverine wetland habitat.

High flow or flood events could cause damage to the bridge piers and abutments. This could result in a need for repair work, which could include rebuilding the abutments; bank armoring; and armoring, reinforcing and/or replacing bridge piers. This would result in

localized, short- and long-term, minor, adverse impacts on riverine wetlands from replacing wetland habitat with the protective measures such as rip rap.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions with the potential to affect wetlands in the project area include road and bridge maintenance and emergency stabilization of the river bank. These actions have likely affected wetlands by removing wetlands vegetation, compacting wetland soils, and installing rip rap or other protective measure. These actions have resulted in short- and long-term, minor adverse impacts on wetlands. The no action alternative would not restore the wetlands in the area, and additional effects could be generated due to continued bridge maintenance and repairs. However, it is likely the protective measures would occur in the same location as past work and no additional riverine wetlands would be affected. Therefore, the no action alternative would contribute slightly to the overall adverse, cumulative effects on wetlands resulting in short-term minor and adverse effects to wetlands near the bridge.

Conclusion. Under the no action alternative, there would be localized, short-term, minor adverse impacts on wetlands. Cumulative impacts would be short-term, minor and adverse.

Because there would be no major adverse impacts on wetlands there would be no impairment of park resources and values. Because the impacts previously described (1) are not inconsistent with the park's purpose and values, (2) do not prevent the attainment of desired future conditions for natural and cultural resources, (3) do not create an unsafe environment, (4) do not diminish opportunities for future enjoyment of the park, and (5) do not unreasonably interfere with park programs or activities, an appropriate use, or concessioner or contractor operations, there would be no unacceptable impacts on wetlands under the no action alternative.

ALTERNATIVE B: MANAGEMENT PREFERRED ALTERNATIVE

Impact of existing bridge removal and new bridge construction

During the project, water would be diverted resulting in temporary impacts on wetland hydrology from temporary dewatering. Impacts would occur as a result of the use of heavy equipment within the wetland area. Heavy equipment would damage wetland vegetation and soils by crushing vegetation and damaging roots, and by compacting wetland soils. Overall, the proposed project would result in the removal of 0.04 acres of sand-bar willow, however, the willows would be salvaged prior to project work, and replanted during restoration, reducing the adverse effects. Potential impacts on water quality were discussed previously in the Water Quality section.

Bridge protection and river restoration

The restoration would stabilize the river bank, increase channel roughness to reduce flow velocities, and realign the channel to a more natural course (FHWA 2006a). The excavation of the depositional area in the middle of the channel would also help realign the

channel to a more natural course. After construction, the disturbed riverbank and the restoration site would be revegetated with native riverine wetland species. Natural revegetation would also occur in the long-term. With mitigation and re-vegetation the management preferred alternative would result in no net loss of wetland functions or values.

Implementation of the management preferred alternative would result in short- term, minor, adverse impacts on wetlands from bridge construction and the restoration work. However, there would be long-term, beneficial effects to riverine wetlands from the restoration work, which would vegetate the reinforced floodplain with native riverine wetland species.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions with the potential to affect wetlands include past bridge maintenance and the emergency stabilization of the west bank. These actions have likely affected wetlands in the project area by disturbing or damaging wetland vegetation, and by compacting wetland soils during in-channel work, and have resulted in short- and long-term, minor adverse impacts on riverine wetlands. The management preferred alternative would contribute slightly to the overall adverse, cumulative effects on wetlands in the short-term. However, there would be long-term, beneficial effects from the restoration efforts, resulting in localized, short-term, minor, adverse, cumulative effects, and localize, long-term beneficial cumulative effects to wetlands in the project area.

Conclusion. The management preferred alternative would result in short-term, minor, adverse impacts on wetlands from bridge construction and the river restoration work. There would be long-term, beneficial effects to riverine wetlands as a result of the bridge replacement and the restoration project. Cumulative effects would be short-term, minor and adverse, as well as long-term and beneficial.

Because there would be no major adverse impacts on wetlands, there would be no impairment of park resources and values. Because the impacts previously described (1) are not inconsistent with the park’s purpose and values, (2) do not prevent the attainment of desired future conditions for natural and cultural resources, (3) do not create an unsafe environment, (4) do not diminish opportunities for future enjoyment of the park, and (5) do not unreasonably interfere with park programs or activities, an appropriate use, or concessioner or contractor operations, there would be no unacceptable impacts on wetlands under the management preferred alternative.

Vegetation and Non-native Species

Impact Intensity and Description

Negligible: The impact on native vegetation would be at the lower levels of detection or not measurable. Non-native species would be unlikely to be introduced.

Minor: The impact on native vegetation would be detectable and could affect the abundance or distribution of individuals in a localized area, but it would not affect the viability of the local population or overall community size, structure, or composition. Non-native species might be introduced but treatment would be successful in the short-term.

Moderate: The impact would be clearly detectable and could have an appreciable effect on the resource. This would include impacts that affect the abundance or distribution of local populations, but not the viability of the regional population. Localized changes to community size, structure or composition and ecological process could occur. Non-native species might be introduced, there treatment would be successful but may take several years.

Major: The impact would be severely adverse or exceptionally beneficial. Impacts would have a substantial, highly noticeable or widespread influence, affecting the abundance or distribution of a local or regional population to the extent that the population would not likely recover(adverse) or would return to a sustainable level (beneficial). Community size, structure or composition and ecological processes would be altered, and landscape level changes could be expected. Non-native species would be introduced and successful treatment would not be achievable over many years.

ALTERNATIVE A: NO ACTION

Under the no action alternative, the NPS would continue management actions that would include regular maintenance of the bridge. These actions would cause some localized disturbance, potentially through minimal removal of vegetation or compacting root systems on the river banks and would be short-term, negligible, and adverse.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions with the potential to affect vegetation include past development in the area, area maintenance activities including road brushing and trail work, the removal of hazard trees, and fire management activities. These actions have the potential to affect vegetation primarily through the removal of vegetation; however there is the potential for the introduction of non native plant species as a result of ground disturbance or project activities. These actions have resulted in short- and long- term, negligible to minor, adverse and beneficial impacts on vegetation in a localized area within the development zone. The no action alternative would contribute slightly resulting in short- and long-term minor adverse cumulative effects to vegetation.

Conclusion. Under the no action alternative, there would be localized, short-term, negligible, adverse impacts on vegetation and

non-native species from minimal removal of vegetation or compacting root systems during routine maintenance activities. There would be short- and long-term minor adverse cumulative effects to vegetation.

Because there would be no major, adverse impacts on vegetation and non-native species there would be no impairment of park resources and values. Because the impacts previously described (1) are not inconsistent with the park's purpose and values, (2) do not prevent the attainment of desired future conditions for natural and cultural resources, (3) do not create an unsafe environment, (4) do not diminish opportunities for future enjoyment of the park, and (5) do not unreasonably interfere with park programs or activities, an appropriate use, or concessioner or contractor operations, there would be no unacceptable impacts on vegetation and non-native species under the no action alternative.

ALTERNATIVE B: MANAGEMENT PREFERRED ALTERNATIVE

Impact of existing bridge removal

To allow access to the river approximately eleven trees would be removed, and 15 more could be removed depending on site conditions. In addition, small shrubs, brush, and tree branches would need to be removed or pruned (Table 8). Tree roots would be impacted by compaction caused by the use of heavy equipment accessing the river. Some vegetation on the river bank would be crushed by equipment. Vegetation would be salvaged prior to construction, based on the recommendations of the park botanist. The removal of the abutments on both sides of the bridge would remove a small amount of existing vegetation around the abutments.

The re-location of the fiberoptic, electrical, and telephone lines would have a short-term minor impact on two large trees upon which the lines would be attached during project work. However, the lines would be placed so as not to constrict or damage the trees.

Impact of new bridge construction

Under the management preferred alternative, equipment accessing the streambed would follow the existing access routes from the bridge removal. However, placement of new riprap around the abutments would impact vegetation on the riverbank up to 2 feet above the 50-year flood elevation.

The cut for the bridge realignment would require the removal of additional trees (Table 8). Additional fill may be placed within the construction limits of the bridge approaches and the realignment of the campground multi-use trail. Tree wells would be installed to protect larger diameter trees within the construction limits and near the multi-use trail. Vegetation on the cutbanks would also be removed. The cutbanks would be stabilized by a native rock wall and the remaining disturbed areas would be revegetated to blend in with the surrounding vegetation.

The re-alignment of the campground multi-use trail approximately fifty feet to the west of the current alignment would have

additional impacts on vegetation. Approximately 90 linear feet of new multi-use trail would be constructed, and the old path would be obliterated and revegetated to match the surrounding vegetation. The multi-use trail would be routed around trees but still could impact the roots of the trees through compaction during construction.

Bridge protection and river restoration

Equipment accessing the streambed to excavate the depositional area in the river channel and install the reinforced floodplain would follow the existing access routes from the bridge construction. The installation of the reinforced floodplain would temporarily impact river bank vegetation as evaluated under "Wetlands." However, the reinforced floodplain would be vegetated once installed. Mitigation measures would also be applied to minimize impacts on trees and vegetation.

The disturbance of the upland area, access areas, and surrounding the bridge would provide substrate for the establishment of non-native species. These areas would be revegetated but vegetation may take several years to reestablish in the area.

Invasive plant propagules may be imported on rock and fill material coming from outside of the park. Mitigation would reduce the potential for importation of non-native seed and propagules, but success cannot be guaranteed. Invasive plant propagules could travel a large distance from their point of introduction at the bridge by using the river as a conduit. The establishment of invasive plants would have short- and long-term, moderate and adverse impacts on native plant populations region-wide. Mitigation would reduce these impacts and follow-up monitoring and treatment would occur at least three years after the project work to determine if mitigation was successful.

Table 8. Total Trees to be Removed under Management Preferred Alternative.

Species	Diameter at Breast Height	Trees to be removed	Trees that may be removed
Incense Cedar	Up to 7"	1	3
	8"-14"	1	0
	15"-24"	0	2
	25"-37"	0	2
Ponderosa Pine	Up to 8"	0	3
	9"-15"	1	2
	16"-24"	6	1
	25"-37"	0	0
Black Cottonwood	24"	1	0
	48"	1 (fused,	0

Species	Diameter at Breast Height	Trees to be removed	Trees that may be removed
		double bole)	
White Fir	12”	0	1
	27”	0	1
TOTAL		11	15

Cumulative Impacts. Past, present, and reasonably foreseeable future actions with the potential to affect vegetation include past development in the area, area maintenance activities including road brushing and trail work, the removal of hazard trees, and fire management activities. As discussed previously, these actions have the potential to affect vegetation primarily through the removal of vegetation and potential for the introduction of non native plant species. These actions have resulted in short- and long- term, negligible to minor, adverse and beneficial impacts on vegetation in a localized area within the development zone. This alternative would add slightly to the overall adverse effect by removing a small number of trees and damaging vegetation during project work. This impact would be offset by restoring native species to the area during and after project work. Overall, cumulative effects would be short- and long-term, minor, adverse and long-term and beneficial.

Conclusion. This alternative would result in localized, short-term, minor impacts from the removal of vegetation; and regional, short-term and long-term, moderate, adverse impacts on vegetation as a result in an increased potential for the introduction of non-native species. The planting of native species after the project work would result in long-term beneficial effects. Cumulative effects would be short- and long-term, minor, adverse and long-term and beneficial.

Because there would be no major, adverse impacts on vegetation there would be no impairment of park resources and values. Because the impacts previously described (1) are not inconsistent with the park’s purpose and values, (2) do not prevent the attainment of desired future conditions for natural and cultural resources, (3) do not create an unsafe environment, (4) do not diminish opportunities for future enjoyment of the park, and (5) do not unreasonably interfere with park programs or activities, an appropriate use, or concessioner or contractor operations, there would be no unacceptable impacts on vegetation and non-native species under the management preferred alternative.

Wildlife and Fisheries

Impact Intensity and Description

Negligible: There would be no observable or measurable impacts on native species, their habitats or the natural processes sustaining them. Impacts would be well within natural fluctuations.

Minor: Impacts would be detectable, short-term, and they would not be expected to be outside the natural range of variability of native species' populations, their habitats or the natural processes sustaining them. Mitigation measures, if needed to offset adverse effects, would be simple and successful.

Moderate: Breeding animals of concern are present; animals are present during particularly vulnerable life-stages, such as migration or juvenile stages; mortality or interference with activities necessary for survival can be expected on an occasional basis, but is not expected to threaten the continued existence of the species in the park unit. Impacts on native species, their habitats or the natural processes sustaining them would be detectable, short-term, and they could be outside the natural range of variability. Mitigation measures, if needed to offset adverse effects, would be extensive and likely successful.

Major: Impacts on native species, their habitats or the natural processes sustaining them would be detectable, long-term, and they would be expected to be outside the natural range of variability. Key ecosystem processes might be disrupted. Loss of habitat might affect the viability of at least some native species. Extensive mitigation measures would be needed to offset any adverse effects and their success would not be guaranteed.

ALTERNATIVE A: NO ACTION

Under the no action alternative, the existing bridge would continue to have long-term, localized, negligible, adverse effects to wildlife from collisions with automobiles, as well as disturbances associated with human activities (e.g. feeding, harassment, noise) already occurring in the Cedar Grove area. Fisheries would continue to be affected by the existence of the bridge in habitat.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions with the potential to affect wildlife and fisheries include the existence of the roadway and associated maintenance activities, bridge maintenance and emergency repairs, development and visitor use in the area.

The existence of the road system and maintenance requirements can disturb and displace wildlife. Small and large mammals, birds, and other wildlife can be injured or killed from collisions with vehicles on park roads. Fisheries habitat has been impacted by past bridge construction and maintenance activities, including the placement of rip rap on the west bank of the project area. The Cedar Grove area of the park has been modified for visitor use and enjoyment. Development of park and concessioner facilities has resulted in removing and modifying wildlife habitat. Impacts would likely continue into the future as habitat (hazard) trees are

removed for safety purposes, and facilities are maintained or modified to meet park and visitor needs. These actions have had long-term adverse minor effects on wildlife and fisheries in the developed area, but negligible effects in the region due to the amount of available and undisturbed habitat nearby. Since there would be no additional effects under this alternative, there would be no cumulative effects.

Conclusion. The existing bridge and facilities would continue to effect wildlife and fisheries resulting in long-term negligible to minor adverse and localized impacts. Because there would be no major, adverse impacts on wildlife and fisheries, there would be no impairment of park resources and values. Because the impacts previously described (1) are not inconsistent with the park's purpose and values, (2) do not prevent the attainment of desired future conditions for natural and cultural resources, (3) do not create an unsafe environment, (4) do not diminish opportunities for future enjoyment of the park, and (5) do not unreasonably interfere with park programs or activities, an appropriate use, or concessioner or contractor operations, there would be no unacceptable impacts on wildlife and fisheries under the management preferred alternative.

ALTERNATIVE B: MANAGEMENT PREFERRED ALTERNATIVE

Impact of existing bridge removal, construction, and restoration activities

Under the management preferred alternative, increased noise from equipment and increased human activities during construction would cause short-term, negligible to minor, adverse impacts on wildlife species; however, these impacts would be temporary and wildlife usage would return once construction is complete. During construction, some small mammals could be temporarily displaced or killed. Larger animals, such as deer, would likely avoid the bridge area during construction. Black bear may be drawn to the area if food is not properly stored and removed. Mitigation measures, including education of construction workers to prevent feeding of wildlife and to properly store food and dispose of garbage in bear-proof containers would be implemented, as is currently enforced with park visitors.

To accommodate the longer bridge and river restoration work, several trees would be removed adjacent to the road corridor. This would impact wildlife by reducing the quality and availability of cover. However, these trees are directly adjacent to the roadway and probably do not provide high quality habitat, therefore, removal of the trees would likely result in only negligible to minor adverse effects to wildlife and habitat. If possible, trees would be removed outside the nesting season for birds.

There are two species of trout known to occur in the Cedar Grove area. The rainbow trout is considered to be wild and native in this segment of the South Fork of the Kings River. The brown trout is an introduced species. The park has no fisheries management activities

in the area, but CDFG does operate a self-reporting creel census box at Roads End to monitor catch success. That area is a designated California Wild Trout Stream (Werner, pers. comm. 2009). There would be short-term, minor, adverse impacts on fish as a result of in-stream activities during construction resulting from increased turbidity and sedimentation downstream. Under the management preferred alternative, equipment accessing the streambed to excavate the depositional area in the river channel and install the reinforced floodplain would follow the existing access routes from the bridge construction. The installation of the reinforced floodplain would temporarily impact the river bed; however, in the long-term, the reinforced floodplain may result in beneficial impacts by restoring habitat of native aquatic species if efforts are successful. Mitigation measures would be implemented to minimize the turbidity.

The management preferred alternative would have short-term, negligible to minor, adverse impacts on wildlife and fisheries and long-term, beneficial impacts on fish.

Cumulative Impacts. As described under the no action alternative, past, present, and reasonably foreseeable future actions with the potential to affect wildlife and fisheries include the existence of the roadway and associated maintenance activities, bridge maintenance and emergency repairs, development and visitor use in the area. These actions have had long-term adverse minor effects on wildlife and fisheries in the developed area, but negligible effects in the region due to the amount of available and undisturbed habitat nearby. The overall cumulative impacts on wildlife and fisheries from past, present, and reasonably future projects, in combination with the management preferred alternative, is short-term, negligible to minor and adverse.

Conclusion. The management preferred alternative would have short-term negligible to minor adverse effects to wildlife and fisheries in the project area, and could result in long-term beneficial effects to fisheries if river restoration activities are successful. Cumulative effects would be short-term, negligible to minor and adverse.

Because there would be no major, adverse impacts on wildlife and fisheries, there would be no impairment of park resources and values. Because the impacts previously described (1) are not inconsistent with the park’s purpose and values, (2) do not prevent the attainment of desired future conditions for natural and cultural resources, (3) do not create an unsafe environment, (4) do not diminish opportunities for future enjoyment of the park, and (5) do not unreasonably interfere with park programs or activities, an appropriate use, or concessioner or contractor operations, there would be no unacceptable impacts on wildlife and fisheries under the management preferred alternative.

Visitor experience, health and safety

Impact Intensity and Description

Negligible: Changes in visitor use, experience and recreational resources would be below or at the level of detection. The visitor would not likely be aware of the effects associated with the alternative. The impacts on visitor or staff health and safety would not be measurable or perceptible.

Minor: Changes in visitor use, experience and recreational resources 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. The effects to health and safety would be detectable, short-term, but would be limited to a relatively small number of visitors or park staff at a localized area.

Moderate: Changes in visitor use, experience and recreational resources would be readily apparent. The visitor would be aware of the effects associated with the alternative and would likely be able to express an opinion about the changes. The effects to health and safety would be readily apparent and result in substantial, noticeable effects on a local scale on a short- or long-term basis.

Major: Changes in visitor use, experience and recreational resources would be readily apparent and severely adverse or exceptionally beneficial. The visitor would be aware of the effects associated with the alternative and would likely express a strong opinion about the changes. The impacts on visitor or staff health and safety would be substantial. Effects would be readily apparent and result in substantial, noticeable effects to safety on a regional scale and long-term basis.

ALTERNATIVE A: NO ACTION

Under the no action alternative, the NPS would continue to periodically maintain the bridge, which could create noise disturbance and traffic delays, adversely impacting area visitors. Most of this work would be conducted on the shoulder season, reducing effects on visitors. There would continue to be a safety risk to visitors and park employees who use the bridge because of weight limitations (currently maximum load of 7 tons). The pedestrian crossing would continue to pose a hazard to visitors and park staff due to its deteriorating conditions and increased tripping hazards. Overall, the no action alternative would result in local, short-term, minor, adverse impacts on visitor experience and health and safety.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions with the potential to affect visitor experience include periodic road and bridge maintenance, and emergency stabilization of

the bridge, which have the potential to affect visitor experience through occasional noise disturbance and bridge restrictions during maintenance work. These actions have resulted in short-term, negligible to minor and adverse impacts on the visitor experience. The continued existence of the low load capacity bridge, and additional maintenance and repairs necessary to maintain the bridge and pedestrian access could put employees at risk, but not beyond their normal duties. Overall, cumulative impacts on visitor experience and visitor and employee health and safety from past, present, and reasonably foreseeable future projects, in combination with the impacts of the no action alternative would be short-term, negligible to minor and adverse. The no action alternative would contribute slightly to the overall adverse, cumulative effects on visitor experience and health and safety.

Conclusion. Under the no action alternative, there would be local, short-term, negligible to minor, adverse impacts on visitor experience resulting from increased bridge maintenance activities. Cumulative impacts would be short-term, negligible to minor, and adverse.

ALTERNATIVE B: MANAGEMENT PREFERRED ALTERNATIVE

Impact of existing bridge removal, bridge construction, and river restoration

Under the management preferred alternative the bridge at Cedar Grove would be closed for one season and part of another season. Most of the work would be done during the shoulder seasons when visitor use is low. These closures would be an inconvenience for visitors using the campgrounds and facilities on the west side of the river because they would no longer be able to directly access the Cedar Grove Lodge located on the east side of the river. The North Side Road would be used as a detour for the Cedar Grove Lodge during bridge construction providing indirect access for those visitors on the west side of the river.

The Lewis Creek Trailhead Parking Area, which is one of the heavier used day use areas in Cedar Grove for picnicking, swimming, and sun bathing, would be used as a turnaround for large vehicles and partially closed during construction (NPS, Torres pers. comm. 2009). The parking area would have five parking spaces open during construction.

Half of the parking lot south of the road on the east side of the bridge would also be closed for use as a staging area. Construction noise during the day would also be noticeable to visitors, but would be limited to daytime hours with the possible exception of when the water and sewer would be transferred.

The Cedar Grove multi-use trail would be detoured during construction and realigned for long-term use of the trail. The realignment would ensure a gradual slope to the crosswalk on the road. The multi-use trail alignment on the other side of the road would also be moved to meet the new crosswalk.

The abovementioned closures and detours would be an inconvenience to visitors using the campgrounds and dayhikers wanting to access the Lewis Creek Trail. However, these closures would be short-term. Visitors wanting to access the Lewis Creek Trail can also access it via the Hotel Creek Trailhead near the juncture of the North Side Road) and the Cedar Grove Residence Road.

The in channel construction activities, including the removal and construction of the bridge and the wood reinforced floodplain would result in visual impacts on visitors which could detract from the visitor experience. The resulting adverse effects would be temporary during and after project work until the area is restored, which could take two to three years. In the long-term, the restoration of the channel to more natural looking conditions would result in beneficial effects to the visitor experience.

The new bridge would be beneficial to visitors and health and safety because it would have an increased load capacity and improved pedestrian access. The travel lanes would be wider and the sidewalk would be accessible, allowing visitors of all abilities to use the sidewalk and view the South Fork of the Kings River.

Cumulative Impacts. As previously discussed, past, present, and reasonably foreseeable future actions including road and bridge maintenance, and emergency stabilization have affected visitor experience through noise disturbance and bridge restrictions during project work. These actions have resulted in short-term, negligible to minor, adverse impacts on visitor experience. There would be minor adverse effects to the visitor experience during construction. Overall, under this alternative, the visitor experience and health and safety of park employees and visitors would improve with the reconstruction of the bridge, adding the universally accessible sidewalk, and widening the travel lanes. Cumulative effects would be short-term negligible to minor and adverse, and long-term and beneficial.

Conclusion. The management preferred alternative would have short-term, minor, adverse impacts on visitor experience from construction and restoration activities. However, there would be long-term beneficial effects to visitor experience and health and safety by increasing the load capacity of the bridge, providing an accessible sidewalk, and widening travel lanes. Cumulative effects would be short-term, negligible to minor and adverse, and long-term and beneficial.

CONSULTATION AND COORDINATION

PUBLIC SCOPING AND CONSULTATION

Sequoia and Kings Canyon National Parks conducted public scoping from December 16, 2008 to January 19, 2009. A press release initiating public scoping was issued on December 16, 2008 (Appendix A) and a scoping letter was sent electronically or by regular mail to 273 individuals, agencies, businesses, interest groups, and media on the parks' mailing list. The SHPO was sent a scoping letter on December 15, 2008, and American Indian groups traditionally associated with the parks were also sent scoping letters (Appendix B) on December 15, 2008. Notification was published on the parks' website and on the NPS planning website (PEPC). The purpose of public scoping was to gain input on the issues or comments related to the proposed project and identify projects in the area that could lead to cumulative impacts.

A total of five comments were received and none provided substantive issues. Most of the comments were expressions of support for the project. One commenter made a suggestion for the alternative to remove the existing bridge and improve the North Side Road, which has since been considered and dismissed as part of the EA process. Even though the scoping information was not published in area newspapers, based on the extensive mailing list and available information on the intranet, outreach is considered sufficient.

The park initiated consultation with the SHPO and the Advisory Council on Historic Preservation (ACHP) in November 2007 as stipulated in Section 106 of the NHPA, as amended. Both agencies were notified of the project by letter. The park had several follow-on conversations with SHPO staff during 2008 and 2009. In consultation with SHPO, the park prepared a determination of eligibility for the Cedar Grove Bridge. The park, with concurrence by the SHPO, determined that the Cedar Grove Bridge was ineligible for inclusion in the National Register of Historic Places. Section 106 consultation was concluded on March 25, 2009.

The park contacted all associated Native American tribes, including Cold Springs Rancheria of Mono Indians, Sierra Nevada Native American Coalition, Sierra Foothill Wuksachi Tribe, North Fork Rancheria of Mono Indians, Eshom Valley Band of Wuksachi Indians, Table Mountain Rancheria, Santa Rosa Rancheria, Paiute-Shoshone of Lone Pine, Tubatulabals of Kern Valley, Native American Heritage Commission, Kern Valley Indian Community, Fort Independence Paiute Indians, Cold Springs Rancheria of Mono Indians, Big Pine Tribe of Owens Valley, Wukchumni Tribal Council, Tule River Indian Reservation, Big Sandy Rancheria of Mono Indians, Eschom Valley Band of Wuksachi Indians, Ft. Independence Indian Reservation, and Bishop Indian Tribal Council by letter on October 10, 2007. No responses were received. Follow-up phone calls were made to each of the tribes in early March 2009. The park discussed the project with a

representative with the most closely affiliated tribes, the Big Pine Paiute Tribe of Owens Valley and the Paiute-Shoshone of Lone Pine. Neither had any concerns about the project. Tribal consultation was concluded on March 11, 2009.

The USFWS and CDFG were also contacted during scoping with followup phone calls, and will be provided with an opportunity to review the document. No formal or informal consultation is required as there would be no effect on listed, candidate, rare, or sensitive species.

PERMIT REQUIREMENTS

Section 401 of the *Clean Water Act* requires a permit for any activity which may result in any discharge into the navigable waters of the United States. As per the USACOE, the project would also need a permit under Section 404 of the *Clean Water Act*. Therefore, Section 401 and 404 permits would be required for this project.

LIST OF PREPARERS AND CONSULTANTS

This EA was prepared by the NPS DSC in coordination with staff from Sequoia and Kings Canyon National Parks, the NPS Pacific West Regional Office, the Federal Highways Administration, and ENTRIX.

Sequoia and Kings Canyon National Parks

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Nancy Hendricks – Environmental Protection Specialist
Jerry Torres – Project Manager
Charisse Sydoriak – Chief of Resource Management and Science
Annie Esperanza – Air Resources Specialist
Tom Burge – Archeologist
Athena Demetry – Restoration Ecologist
Sylvia Haultain – Plant Ecologist
Harold Werner – Wildlife Ecologist
John Austin – Biological Scientist-Fire Ecology
Tom Warner, Forester
Bob Meadows, Forester
Gregg Fauth, Wilderness and Wild and Scenic River Coordinator

National Park Service – Pacific West Regional Office

Alan Schmierer, Regional Environmental Coordinator
Judy Rocchio, Regional Air Quality and Night Skies Specialist

National Park Service – Denver Service Center

Cam Hugie – Project Manager
Darin Thacker – Project Specialist
Jeri DeYoung – Cultural Resources Specialist
Ginger Molitor – Natural Resources Specialist
Steven Hoffman – Natural Resources Specialist

Federal Highway Administration/Central Federal Highway & Lands Division

Pat Flynn – Project Manager
Angela Johnson – Design Team Leader

Karl Eikermann – Structural Engineer
Mike Smith – Landscape Architect
Veronica Jacobson – Geotechnical Engineer
Khamis Haramy – Geotechnical Engineer
Scott Hogan - Hydrologist

ENTRIX

Charley Miller, P.E., Senior Consultant

AGENCIES, ORGANIZATIONS, AND INDIVIDUALS CONSULTED

Agencies and organizations contacted to assist in identifying issues and provided with an opportunity to review or comment on this EA include, but are not limited to, the following:

Federal Agencies

U.S. Fish and Wildlife Service
U.S. Geological Survey, Biological Resources Division, Western Ecological Research Center
USDA Forest Service: Inyo, Sequoia, and Sierra National Forests

Congressional Representatives

Senator Barbara Boxer
Senator Dianne Feinstein
The Honorable Cal Dooley
The Honorable Devin Nunes
Senator William J. "Pete" Knight
Senator Charles Poochigian
Assemblyman Mike Briggs

State and Local Agencies and Individuals of California

California State Historic Preservation Officer
California Department of Fish and Game
California Department of Forestry
California Department of Forestry and Fire Protection
Fresno County Board of Supervisors
Tulare County Board of Supervisors
Mr. Allen Ishida, District One Supervisor, Tulare County

American Indian Tribes, Organizations, and Individuals

Big Pine Paiute Tribe of the Owens Valley
Big Sandy Rancheria of Mono Indians
California Native American Heritage Commission
Cold Springs Rancheria of Mono Indians
Dunlap Band of Mono Indians
Fort Independence Indian Community of Paiute Indians
Kern Valley Indian Community
North Fork Rancheria of Mono Indians
Paiute–Shoshone Indians of the Bishop Community
Santa Rosa Rancheria
Sierra Foothill Waksachi Tribe
Sierra Nevada Native American Coalition

Table Mountain Rancheria
Tule River Indian Reservation
Wukchumni Tribal Council

Other Groups and Organizations

California Preservation Foundation
Center for Biological Diversity, California and Pacific Office
Fresno Audubon Society
Friends of the Earth
High Sierra Hiker’s Association
Mineral King District Association
National Audubon Society
National Parks and Conservation Association
The Nature Conservancy, California Field Office
Sequoia Forest Alliance
Sierra Club
Kern–Kaweah Chapter
Sacramento Field Office
Sierra Forest Products
Tulare County Audubon Society
The Wilderness Society
Wilderness Watch
The Wildlife Society, San Joaquin Valley Chapter

Area Libraries

Tulare County Libraries
Exeter Branch Library
Lindsay Branch Library
Tulare County Law Library
Fresno County Libraries
Central Branch Library
Sunnyside Branch Library
Fowler Branch Library
Kingsburg Branch Library
Orange Cove Branch Library
Parlier Branch Library
Reedley Branch Library
Sanger Branch Library
Selma Branch Library

REFERENCES

Laws Referenced

The Antiquities Act of 1906 (June 8, 1906). 16 U.S.C. §§ 431-433.

Archeological Resources Protection Act of 1979. 16 U.S.C. §§ 470aa – 470mm.

Bald and Golden Eagle Protection Act, as amended January 3, 2007. 16 U.S.C. 668 a-d.

Clean Air Act of 1963, as amended. 42 U.S.C. 7401 et seq.; Pub. L. 88-206; 77 Stat. 392.

Clean Water Act of 1972, as amended. 33 U.S.C. 1251 et seq.; Pub. L. 92-500; 86 Stat. L. 816. October 18, 1972.

Council on Environmental Quality (CEQ). 40 CFR 1500 et seq.

Endangered Species Act of 1973 (ESA), as amended. 16 U.S.C. 1531–1544; Pub. L. 93-205; 87 Stat. L. 884. Approved December 28, 1973.

Executive Order 11988, Floodplain Management. 42 FR 26951. May 24, 1977.

Executive Order 11990, Protection of Wetlands. 42 FR 26961. May 24, 1977.

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. 59 FR 7629. February 11, 1994.

Federal Noxious Weed Act. 93-629 (January 3, 1975) 7 U.S.C. 2801 et seq.

Federal Water Pollution Control Act, as amended November 27, 2002. 33 U.S.C. 1251 et. Seq. (PL 107-303).

Fish and Wildlife Coordination Act (March 10, 1934). 16 U.S.C. 661-667e.

General Authorities Act. 16 U.S.C. 1a-1; Pub. L. 91-383; 84 Stat. L. 825. August 18, 1970.

National Environmental Policy Act of 1969 (NEPA), as amended. 42 U.S.C. 4321 et seq.; Pub. L. 91-190, Sec. 2; 83 Stat. L. 852. Jan. 1, 1970.

National Historic Preservation Act of 1966 (NHPA), as amended. 16 U.S.C. 470 et seq.; Pub. L. 89-665. October 15, 1966.

National Park Service Organic Act. 16 U.S.C. 1 et seq. August. 25, 1916.

National Register of Historic Places. 36 CFR 60. July 1, 2004.

Native American Graves Protection and Repatriation Act of 1990. 25 U.S.C. 3001–3013; Pub. L. 101-601; 104 Stat. L. 3048. November 16, 1990.

Omnibus Public Land Management Act of 2009. H.R. 146. March 30, 2009. 16 U.S.C. 1901-1904.

Protection of Historic Properties, Section 106 Procedures. 36 CFR 800. July 1, 2003.

Redwood Act. 16 U.S.C. 1a-1; Pub. L. 95-250; 92 Stat. L. 163. March 27, 1978.

Rehabilitation Act of 1973, as amended, section 504. 29 U.S.C. 794; Pub. L. 93-112.

Secretarial Order 3175: Identification, Conservation, and Protection of Indian Trust Assets. November 8, 1993.

Wild and Scenic Rivers Act (October 2, 1968). 16 U.S.C. 1271 et seq.

Wilderness Act of 1964. 16 U.S.C. 1131–1136; P. L. 88-577; 78 Stat. L. 890. Enacted September 3, 1964.

Selected Bibliography

AIRNow (Cross-agency U.S. Government Website) 2009. Explore Air Website for Sequoia and Kings Canyon National Parks. Available on the internet at: http://www.nature.nps.gov/air/WebCams/parks/sekicam/ sekicam.cfm. Accessed January 28, 2009.

Austin, J.T. (Sequoia and Kings Canyon National Parks). 2008. Personal communication about Cedar Grove Bridge Background E-mail attachment dated November 20, 2008.

BRW, Inc., and Lee Engineering. 1999. “Draft Transportation and Visitor Use Data Summary [for Summer 1998].” Prepared for the National Park Service. On file at Sequoia/ Kings Canyon National Parks, Three Rivers, CA.

Burge, T. (Sequoia and Kings Canyon National Parks). 2006 Personal communication about Indian trust resources in the parks August 8, 2006.

California Department of Fish and Game. 2008. Endangered species lists. California Department of Habitat Conservation. Available on the internet at: http://www.dfg.ca.gov/whdab/pdf/TEAnimals.pdf. Accessed: November 15, 2008.
Code of Federal Regulations (CFR)

36 CFR 800. TITLE 36 – Parks, Forests, and Public Property.

Chapter VIII – Advisory Council on Historic Preservation. Part 800- Protection of Historic Properties. (Implementing regulations of Section 106 of the NHPA.) *Includes*:

- 36 CFR 800, § 106. Protection of Historic Properties
- 36 CFR 800.5. Assessment of Adverse Effects
- 36 CFR 800.13. Post-review discoveries
- 36 CFR 800 Part 60. National Register of Historic Places
- 36 CFR 800 Part 79. Curation of Federally-owned and Administered Archaeological Collections.

Cordes, J. (U.S. Forest Service) 2009. Personal Communication. Telephone Conversation about Occurrence of Yellow Star Thistle at Convict Flats in Sequoia National Forest.

Cory, L., P. Field, and W. Serat. 1970. "Distribution Patterns of DDT Residues in the Sierra Nevada Mountains." *Pesticides Monitoring Journal* 3:204-11.

Cowardin, L.M., V. Carter, F.C. Golet, E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Department of the Interior. U.S. Fish and Wildlife Service, Washington, D.C. 131 pp.

Dunne, T. and L.B. Leopold. 1978. Water in Environmental Planning. New York, NY: W.H. Freeman and Company.

Eikermann, K. (FHWA/CFLHD). 2009. Personal communication: Email attachment with itemized list of fill and excavation needs and equipment for the Cedar Grove Bridge project, Sequoia and Kings Canyon National Parks dated January 28, 2009.

Federal Highway Administration, U.S. Department of Transportation

———. 2008. Draft Proposed Preferred Alternative Drawing for the Kings River Bridge Project, Sequoia and Kings Canyon National Parks. Drawing No. RG2807-E.

———. 2006a. Memorandum: Kings River Cedar Grove Village Bridge Replacement – Bridge Configuration Review. On file at the Denver Service Center, National Park Service.

———. 2006b. Bridge Inspection Report Summary, Cedar Grove Bridge. On file at the Denver Service Center, National Park Service.

———. 2005. Bridge Inspection Report. Generals Highway and Cedar Grove Bridge. On file at the Denver Service Center, National Park Service.

Federal Register

———. 1999. Executive Order 13112. Establishment of the National Invasive Species Council. Vol. 64, No. 25, February 3, 1999.

———. 1994. Executive Order 12898. Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. Vol. 59, No. 32, p. 7629. February 16, 1994.

———. 1978. Executive Order 12088, Federal Compliance with Pollution Control Standards. Vol. 43, p. 47707. October 13, 1978.

———. 1977. Executive Order 11988, Floodplain Management. Vol. 42, p.26971. May 24, 1977.

———. 1977. Executive Order 11990, Protection of Wetlands. Vol. 42, p. 26961. May 24, 1977.

Haultain, S. (Sequoia and Kings Canyon National Parks). 2009. Cedar Grove Bridge Plant Survey Report. On file at the Denver Service Center, National Park Service.

Lewis, J.C. and D.W. Stinson. 1998. Final Fisher Status Report. Washington Department of Fish and Wildlife. Available on the internet at: http://wdfw.wa.gov/wlm/diversty/soc/status/fisher /fshrxsum.htm. Accessed: June 6. 2007.

Melack, J. M., J. Sickman, F. Setaro, and D. Dawson. 1995. "Monitoring of Wet Deposition in Alpine Areas of the Sierra Nevada." Final Report. Sacramento: California Air Resources Board.

Melack, J.M., J.L. Stoddard, and C.A. Ochs. 1985. "Major Ion Chemistry and Sensitivity to Acid Precipitation of Sierra Nevada Lakes." *Water Resources Research* 21:27-32.

Miller, C. (ENTRIX). 2009. Schematic Design Plans for Reinforced Floodplains. On file at the Denver Service Center, National Park Service.

Miller, Karen G. 1993. *Cedar Grove Prescribed Burn Units*. Report on file at Sequoia and Kings Canyon National Parks, Ash Mountain CRM Office.

National Oceanic and Atmospheric Administration, U.S. Department of Commerce. 1973. Precipitation-Frequency Atlas of the Western United States: Volume XI-California.

National Park Service, U.S. Department of Interior

———. 2009. Invasive Non-native Plants. Sequoia and Kings Canyon National Parks. Available on the internet at: http://www.nps.gov/seki/naturescience/nnpmain.htm. Accessed April 26, 2009.

———. 2008a. Superintendent's Compendium. Sequoia and Kings Canyon National Parks. Revised July 2008.

——. 2008b. NPS Management Policies and Procedural Manual #77-1: Wetland Protection. U.S. Department of the Interior, National Park Service.

——. 2008c. CLIMATEFriendly PARKS Sequoia and Kings Canyon National Parks Action Plan, National Park Service. Available at Sequoia and Kings Canyon National Parks.

——. 2007. Final General Management Plan/Environmental Impact Statement Record of Decision. Sequoia and Kings Canyon National Parks, Tulare County, California.

——. 2006. *NPS Management Policies*. U.S. Department of the Interior, National Park Service.

——. 2005. NPS Museum Handbook. U. S. Department of the Interior, National Park Service.

——. 2003. Director's Order 77-2: Floodplain Management. U.S. Department of the Interior, National Park Service.

——. 2002. NPS Procedural Manual 77-2: Floodplain Management. U.S. Department of the Interior, National Park Service.

——. 2002 Director's Order 77-1: Wetland Protection. U.S. Department of the Interior, National Park Service.

——. 2001. Director's Order 12 and Handbook: Conservation Planning, Environmental Impact Analysis, and Decision-Making.

——. 2000. Director's Order 47: Soundscape Preservation and Noise Management. U.S. Department of the Interior, National Park Service.

——. 1999. Director's Order 24: Standards for National Park Service Museum Collections Management. U.S. Department of the Interior, National Park Service.

——. 1999. Director's Order 41: Wilderness Preservation and Management. U.S. Department of the Interior, National Park Service.

——. 1998. Director's Order 28, Cultural Resource Management Guidelines. U.S. Department of the Interior, National Park Service.

——. 1984. NPS Park Roads Standards

Napton, Kyle L. 1974. *Archeological Survey in Kings Canyon-Sequoia National Parks*. Report on file at Sequoia and Kings Canyon National Parks, Ash Mountain CRM Office.

Ratliff, R.D., M.R. George, and N.K. McDonald. 2005. "Ambient Air Quality Standards and Valley Attainment Status." San Joaquin Valley Air Pollution Control District. Available on the internet at:http://www.valleyair.org/aqinfo/attainment/html. Accessed: July 12, 2005.

San Joaquin Valley Air Pollution Control District. 2008. "Ambient Air Monitoring Network Plan." Fresno, CA. May 28, 2008.

Siefkin, Nelson. 1997. *Cedar Grove Prescribed Burn Units (Roaring River, Maintenance, Copper Creek)*. Report on file at Sequoia and Kings Canyon National Parks, Ash Mountain CRM Office.

Sickman, J.M. and J.M. Melack. 1989. "Characterization of Year-round Sensitivity of California's Montane Lakes to Acidic Deposition." Final Report. California Air Resources Board, Sacramento.

Smillie, G. (NPS Washington Office Water Resources Division) and S. Hogan (FHWA-CFLHD). 2009. Personal Communication Telephone Conversation about Hydrological Impacts Related to All Alternatives Considered and the Proposed Restoration Project. May 18, 2009.

Torres, J. (National Park Service). 2009. Personal Communication. Comment on Draft 1 of Cedar Grove Bridge Environmental Assessment. April 20, 2009.

U.S. Army Corps of Engineer, U.S. Department of Defense. 1987. "Corps of Engineers Wetlands Delineation Manual," by U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

U.S. Fish and Wildlife Service, U.S. Department of Interior. 2007. Endangered Species Lists. Ecological Services, Sacramento Field Office. Available on the internet at: http://www.fws.gov/sacramento/es/spp_list.htm. Accessed June 06, 2007.

Washington Department of Fish and Wildlife, Washington Department of Transportation, and Washington Department of Ecology. 2008 Integrated Streambank Protection Guidelines. April 2003. Accessed on the Internet at: http://wdfw.wa.gov/hab/ahg/ispgdoc.htm December 15, 2008.

Werner, H. (Sequoia and Kings Canyon National Parks). 2009. Personal communication: Email notification of status of special concern species within project area dated January 28, 2009.

Williams, M.R. and J. Melack. 1997. "Effects of Prescribed Burning and Drought on the Solute Chemistry of Mixed-Conifer Forest Streams of the Sierra Nevada, California." *Biogeochemistry* 39:225-53.

Zabik, J.M. and J.N. Seiber. 1993. "Atmospheric Transport of Organophosphate Pesticides from California's Central Valley to the Sierra Nevada Mountains." *Journal of Environmental Quality* 22:80-90.

APPENDICES

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National Park Service
U.S. Department of the Interior

Office of the Superintendent
47050 Generals Highway
Three Rivers, CA 93271-9651

(559) 565-3341 phone
(559) 565-3730 fax
http://www.nps.gov/seki

Sequoia and Kings Canyon National Parks
News Release

For Immediate Release – December 17, 2008
Contact Christine Smith: (559) 565-3105

The National Park Service is Requesting Comments from the Public for a Proposed Bridge Replacement in Cedar Grove Village

Three Rivers, CA – Superintendent Craig C. Axtell announces that Sequoia and Kings Canyon National Parks propose to replace the 1930's era,140-foot bridge spanning the Kings River at Cedar Grove Village in Kings Canyon National Park. The purpose of this project is 1) to provide safe, durable, sustainable passage for vehicles, pedestrians, bicycles, and utilities crossing the South Fork of the Kings River at Cedar Grove Village, and 2) to improve the river's ability to flow in a wild and natural course to better protect the river's outstandingly remarkable values as a National Wild and Scenic River.

In accordance with the National Environmental Policy Act (NEPA), the National Park Service is initiating preparation of an environmental assessment (EA) for this project. The EA will analyze and disclose potential impacts of alternatives for replacing the bridge.

The National Park Service is soliciting input from organizations, agencies, and individuals as part of the scoping process. The purpose of scoping is to identify the range of issues to be addressed in the EA as well as potential alternatives for the project. The public is invited to direct concerns or comments regarding this project to the Park in writing by sending an e-mail to seki_planning@nps.gov, or through the NPS Planning, Environment and Public Comment (PEPC) website at http://parkplanning.nps.gov/seki, or mailed to: Sequoia and Kings Canyon National Parks, Planning and Compliance Office, 47050 Generals Highway, Three Rivers, CA 93271-9651. Please include the phrase "Cedar Grove Bridge Replacement" at the top of your comment or in your e-mail subject line.

Scoping comments are requested by January 19, 2009. Once the scoping period concludes, all comments submitted will be considered, and a range of alternatives to replace the bridge will be developed. The public, agencies, and other interested parties will have an opportunity to review and comment on the range of alternatives before they are finalized.

Before including an 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. While 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. Anonymous comments will not be accepted.

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Appendix B. Advisory Council on Historic Preservation and State Historic Preservation Officer Scoping Letters

United States Department of the Interior

NATIONAL PARK SERVICE
Sequoia and Kings Canyon National Parks
47050 Generals Highway
Three Rivers, California 93271-9651
(559) 565-3341

IN REPLY REFER TO:

H4217 (SEKI)

December 15, 2008

Kelly Yasaitis Fanizzo, JD, Program Analyst
Advisory Council on Historic Preservation
Old Post Office Building
1100 Pennsylvania Avenue, NW, Suite 803
Washington, DC 20004

Dear Ms. Fanizzo:

The National Park Service (NPS) and the Federal Highway Administration/Central Federal Lands Highway Division are developing plans for the replacement of the 140-foot-long bridge spanning the South Fork of the Kings River at Cedar Grove Village, Kings Canyon National Park, Tulare County, California.

The purposes of the project are to improve the river's ability to flow in a wild and natural course, better protect the river's outstanding values as a National Wild and Scenic River, and provide safe, durable, sustainable passage for motor vehicles, pedestrians, bicycles, and utilities crossing the river.

The current bridge design has caused deposition immediately upstream of the bridge and has led to erosion along the bank, altering the natural river channel and fluvial processes. During high water flows, scouring of the bridge embankment occurs to where the NPS has needed to rebuild the embankment with hardened materials to maintain the bridge approach. The current bridge design, dating to the 1930s, restricts channel flow and does not accommodate 100-year-flood concerns.

The existing bridge has a very low load capacity and cannot continue to safely handle large vehicles, particularly heavy loads and emergency services vehicles, traversing the river. The bridge is aging and does not meet Federal Highway Administration weight standards. The original design of the bridge had a Normal Traffic Rating of 15 tons, however, due to the degradation of the bridge engineers from the Federal Highways Administration have downgraded the limit to 7 tons.

The NPS is planning to use the National Environmental Policy Act (NEPA) process to also address National Historic Preservation Act (NHPA) section 106 needs, as outlined in 36 CFR

TAKE PRIDE IN AMERICA

800.8. This letter is being sent to provide your office with advance notification of the NPS's intent to use the NEPA process for the preparation of an Environmental Assessment (EA) to comply with the project's section 106 requirements. In accordance with 36 CFR 800.8(a)(3)(c), we are also notifying the Advisory Council on Historic Preservation (ACHP) by copy of this letter.

We look forward to working with you as we proceed with our environmental planning. Please do not hesitate to contact us if you have any initial concerns or comments regarding the proposed project. Cultural Resources Specialist, Tom Burge, can be reached directly at (559) 565-3139 if you have any questions regarding this proposed project. Thank you for your assistance with the matter.

Sincerely,

Colleen Bastle for

Craig C. Axtell
Superintendent

cc:

Milford W. Donaldson, State Historic Preservation Officer
Office of Historic Preservation, Department of Parks and Recreation
P.O. Box 942896
Sacramento, California 94296-0001

United States Department of the Interior

NATIONAL PARK SERVICE
Sequoia and Kings Canyon National Parks
47050 Generals Highway
Three Rivers, California 93271-9651
(559) 565-3341

IN REPLY REFER TO:

H4217 (SEKI)

December 15, 2008

Milford W. Donaldson, State Historic Preservation Officer
Office of Historic Preservation, Department of Parks and Recreation
P.O. Box 942896
Sacramento, California 94296-0001

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The National Park Service (NPS) and the Federal Highway Administration/Central Federal Lands Highway Division are developing plans for the replacement of the 140-foot-long bridge spanning the South Fork of the Kings River at Cedar Grove Village, Kings Canyon National Park, Tulare County, California.

The purposes of the project are to improve the river's ability to flow in a wild and natural course, better protect the river's outstanding values as a National Wild and Scenic River, and provide safe, durable, sustainable passage for motor vehicles, pedestrians, bicycles, and utilities crossing the river.

The current bridge design has caused deposition immediately upstream of the bridge and has led to erosion along the bank, altering the natural river channel and fluvial processes. During high water flows, scouring of the bridge embankment occurs to where the NPS has needed to rebuild the embankment with hardened materials to maintain the bridge approach. The current bridge design, dating to the 1930s, restricts channel flow and does not accommodate 100-year-flood concerns.

The existing bridge has a very low load capacity and cannot continue to safely handle large vehicles, particularly heavy loads and emergency services vehicles, traversing the river. The bridge is aging and does not meet Federal Highway Administration weight standards. The original design of the bridge had a Normal Traffic Rating of 15 tons, however, due to the degradation of the bridge engineers from the Federal Highways Administration have downgraded the limit to 7 tons.

The NPS is planning to use the National Environmental Policy Act (NEPA) process to also address National Historic Preservation Act (NHPA) section 106 needs, as outlined in 36 CFR 800.8. This letter is being sent to provide your office with advance notification of the NPS's

intent to use the NEPA process for the preparation of an Environmental Assessment (EA) to comply with the project's section 106 requirements. In accordance with 36 CFR 800.8(a)(3)(c), we are also notifying the Advisory Council on Historic Preservation (ACHP) by copy of this letter.

We look forward to working with you as we proceed with our environmental planning. Please do not hesitate to contact us if you have any initial concerns or comments regarding the proposed project. Cultural Resources Specialist, Tom Burge, can be reached directly at (559) 565-3139 if you have any questions regarding this proposed project. Thank you for your assistance with the matter.

Sincerely,

Colleen C. Bathe for

Craig C. Axtell
Superintendent

cc:

Kelly Yasaitis Fanizzo, JD, Program Analyst
Advisory Council on Historic Preservation
Old Post Office Building
1100 Pennsylvania Avenue, NW, Suite 803
Washington, DC 20004

Appendix C. Tribes and Tribal Representatives Contacted During Scoping and Scoping Letter

FIRST NAM	LAST NAM	TRIBE NAME	ADDRESS	CITY	STATE	POSTAL
Tina	Williams	Cold Springs Rancheria of Mono Indians	P.O. Box 209	Tollhouse	CA	93667
RoseAnn	Dominguez	Sierra Foothill Wuksachi Tribe	31404 Ruth Hill Road	Squaw Valley	CA	93675
Leanne	Walker-Grant	Table Mountain Rancheria	P.O. Box 445	Friant	CA	93626
Rachel A.	Joseph	Paiute-Shoshone of Lone Pine	P.O. Box 747	Lone Pine	CA	93545
Mike	Sisco	Santa Rosa Rancheria	P.O. Box 8	Lemoore	CA	93245
Delores	Roberts	North Fork Rancheria of Mono Indians	P.O. Box 929	North Fork	CA	93643
Richard	Wilder	Fort Independence Paiute Indians	P.O. Box 67	Independence	CA	93526
Jennifer	Philley	Cold Springs Rancheria of Mono Indians	P.O. Box 209	Tollhouse	CA	93667
Jessica	Bacoch	Big Pine Paiute Tribe of Owens Valley	P.O. Box 700	Big Pine	CA	93513
Neil	Peyron	Tule River Indian Reservation	P.O. Box 589	Porterville	CA	93258
Connie	Lewis	Big Sandy Rancheria of Mono Indians	P.O. Box 337	Auberry	CA	93602
Greg	Shipman	Bishop Indian Tribal Council	50 Tu Su Lane	Bishop	CA	93514

United States Department of the Interior

NATIONAL PARK SERVICE
Sequoia and Kings Canyon National Parks
47050 Generals Highway
Three Rivers, California 93271-9651
(559) 565-3341

IN REPLY REFER TO:

H4217 (SEKI)

December 15, 2008

Richard Wilder
Fort Independence Paiute Indians
P.O. Box 67
Independence, CA 93526

Dear Richard Wilder:

I am writing to seek your comments on a proposed project within Sequoia and Kings Canyon National Parks. The National Park Service in cooperation with the Federal Highway Administration/Central Federal Lands Highway Division is proposing to replace the 1930s era 140-foot bridge spanning the South Fork of the Kings River at Cedar Grove Village in Kings Canyon National Park, Tulare County (photos of area are attached), California. The purpose of this project is to improve the river's ability to flow in a wild and natural course to better protect the river's outstandingly remarkable values as a National Wild and Scenic River and provide a safe, durable, sustainable passage for vehicles, pedestrians, bicycles, and utilities crossing the South Fork of the Kings Canyon River at Cedar Grove Village.

The current bridge construction has caused deposition immediately upstream of the bridge and has led to erosion along the bank, altering the natural river channel and fluvial processes. During high water flows, scouring of the bridge embankment occurs and the National Park Service has needed to build the embankment back up with hardened materials to maintain the bridge approach. The current bridge design restricts channel flow and does not accommodate 100-year floodplain concerns.

The existing bridge has a very low load capacity and cannot continue to safely handle large vehicles, particularly heavy loads and emergency services vehicles, traversing the river. The bridge is aging and does not meet Federal Highway Administration weight standards. The original design of the bridge had a Normal Traffic Rating of 15 tons, however, due to the degradation of the bridge engineers from the Federal Highways Administration have downgraded the limit to 7 tons

Although development of the environmental assessment is in the preliminary stages, we believe that eventual implementation of the project may/could affect properties included in or that may

be eligible for inclusion in the National Register of Historic Places. In accordance with the Advisory Council on Historic Preservation regulations, 36 CFR Part 800: *Protection of Historic Properties*, the National Park Service is required to comply with Section 106 of the National Historic Preservation Act of 1966 (as amended). This scoping notice serves to officially initiate Section 106 consultation with your tribe. Formal Section 106 consultation has also been initiated with the California State Historic Preservation Office as well as multiple other agencies, organizations, and individuals.

In addition, in accordance with 36 CFR Part 800.8(c): *Use of the NEPA process for Section 106 purposes*, this letter also serves to notify you of our intention to use the NEPA process for all subsequent Section 106 consultation on this project. We have already identified consulting parties both for NEPA and Section 106 purposes, and are now working to identify all applicable historic properties.

We look forward to working with you as we proceed with the environmental planning process for this project. Please contact us with any initial comments or concerns you may have. Cultural Resources Specialist, Tom Burge, can be reached directly at (559) 565-3139, if you have any questions regarding this proposed project.

Sincerely,

Colleen C. Bathe for

Craig C. Axtell
Superintendent

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WILD AND SCENIC RIVERS ACT

SECTION 7(a) DETERMINATION

South Fork of the Kings River Wild and Scenic River

BRIDGE REPLACEMENT AT CEDAR GROVE SEQUOIA AND KINGS CANYON NATIONAL PARKS CALIFORNIA

Recommended:

_____

Superintendent, Sequoia and Kings Canyon National Parks Date

Approved:

_____

Pacific West Regional Director Date

INTRODUCTION

The South Fork of the Kings River in Sequoia and Kings Canyon is a component of the National Wild and Scenic Rivers System. Projects that involve construction in the bed or on the banks of the South Fork of the Kings River are water resources projects that require review under Section 7 of the Wild and Scenic Rivers Act. The authority for this determination was enacted under Section 7 (a) of the Wild and Scenic Rivers Act (PL 90-542, as amended, 16 USC 1271-1278). Section 7(a) states, in part:

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

The Kings River is the largest free-flowing river in the Sierra Nevada. Approximately 88.8 river miles of the Middle Fork, South Fork, and main stem of the Kings River were added to the national wild and scenic rivers system on November 3, 1987 (PL 100-150).

The portions of the Middle and South Forks of the Kings River managed by the NPS begin in glacial lakes above timberline and flow through deep, steep-sided canyons, over falls and cataracts, and eventually become an outstanding whitewater rafting river in Sequoia National Forest. Both the Middle and South Forks flow through extensive and spectacular glacial canyons. All of the Middle Fork is within designated wilderness, as is the upper portion (24.1 miles) of the South Fork. The lower segment of the South Fork canyon is known as the Kings Canyon, giving the park its name. The Kings Canyon, including the Cedar Grove developed area, is the only segment of the Kings River accessible by motor vehicle and has been classified as a recreational river.

The Wild and Scenic Rivers Act does not prohibit development along a river corridor; however, the act does specify guidelines for the determination of appropriate actions within the bed and banks of a Wild and Scenic River (National Park Service [NPS], Department of Interior [DOI], U.S. Forest Service [USFS], U.S. Department of Agriculture [USDA] 1982). As the designated manager for the South Fork of the Kings River upper segments within the boundaries of Kings Canyon National Park, the NPS must prepare a Section 7 determination on all proposed water resources projects, including bridges and other roadway construction/reconstruction projects, to ensure they do not directly and adversely impact the free-flowing condition or the values for which the river was designated.

WILD AND SCENIC RIVER DESIGNATION

In 1987, Congress designated the Middle and South Forks of the Kings River Wild and Scenic to protect the free-flowing condition and to protect and enhance their unique values for the benefit and enjoyment of present and future generations (16 USC 1271). Section 2 of the Wild and Scenic Rivers Act requires that designated rivers be classified and administered as Wild, Scenic, or Recreational river segments, based on the condition of the river corridor at the time of boundary designation. The classification of a river segment indicates the level of development on the shorelines. Classifications are defined in the act as follows:

Wild river areas – Those rivers or section of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and water unpolluted. These represent vestiges of primitive America.

Scenic river areas – Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

Recreational river areas – Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

Under the Wild and Scenic Rivers Act, outstandingly remarkable values (ORVs) are defined as those resources that are river-related and rare, unique, or exemplary in a regional or national context. The lower segment of the South Fork of the Kings River, which includes the project area has the following ORVs: scenic, recreational, and geologic (NPS 2007).

The lower segment of the South Fork of the Kings River is 7.6 miles long. The river corridor boundary extends 0.25 mile on each side of the river. This recreational river segment flows through the floor of the Kings Canyon. The area is open seasonally, typically from May through October. There are limited areas of development, managed river-based recreation, and defined river access points. The use of flotation devices, boats, or rafts is prohibited on the South Fork of the Kings River from Bubbs Creek Bridge downstream to the Kings Canyon National Park boundary. Regular inspection of the condition of resources, including the river's outstandingly remarkable values is required. Hiking and other forms of recreation, such as fishing, picnicking, and bicycle use are allowed within the river corridor, pursuant to existing regulations.

SECTION 7(A) DETERMINATION

The Section 7(a) evaluation for the Bridge Replacement at Cedar Grove project is based on guidance provided within the Wild and Scenic Rivers Act: Section 7 Technical Report (Interagency Wild and Scenic Rivers Coordinating Council 1997), Appendix C, Evaluation Procedure under the heading Direct and Adverse. The direct and adverse evaluation procedure is carried out for water resources projects within the Wild and Scenic River boundary of the designated river. The NPS, in cooperation with the Federal Highway Administration/ Central Federal Lands Highway Division (FHWA/CFLHD) is proposing to replace the 142-foot bridge spanning the South Fork of the Kings River at Cedar Grove Village in Sequoia and Kings Canyon National Parks (parks), Fresno County, California. The proposed bridge replacement project would occur within the Wild and Scenic boundary of the South Fork of the Kings River (Figure 1). The Section 7 determination process presented herein applies only to the preferred alternative of the environmental assessment (EA).

PURPOSE AND NEED FOR ACTION

PURPOSE

In its current condition, the bridge does not provide a safe, durable, sustainable passage for vehicles at Cedar Grove, is unsafe for pedestrians and bicycles, and restricts the free-flowing character of the South Fork of the Kings River, particularly during high water and flood events.

The purpose of this project is to maintain and enhance access for visitors, park employees, and concessioners in the Cedar Grove area, in a safe and sustainable manner.

The second purpose of this project is to meet the mandates of the Wild and Scenic Rivers Act (16 U.S.C. 1271 et seq.). The 7.6-mile segment of the South Fork of the Kings River, including the project area, is a designated Wild and Scenic River, classified as a recreational

river segment. In accordance with the Wild and Scenic Rivers Act, this area will be administered in such a manner as to protect and enhance the values that caused it to be included, without limiting other uses that do not substantially interfere with public use and enjoyment of these values. NPS *Management Policies* directs the parks to take no management actions that could adversely affect the values that qualify a river for the national wild and scenic rivers system (4.3.4) (NPS 2006).

The final purpose of this project is to implement a component of the approved FGMP/EIS for the parks. The FGMP/EIS calls for the replacement of the Cedar Grove Village Bridge to reduce impacts and increase sustainability (NPS 2007).The FGMP/EIS directs the parks to protect the free-flowing character of river areas and to maintain and enhance the integrated ecological functions, natural hydrological, and free-flowing condition of park rivers.

NEED

The need for the action is to reconstruct the bridge in a manner that would improve sustainability and meet standard weight requirements, to continue to provide for visitor and park access, while protecting and enhancing the values of the Cedar Grove Bridge, in accordance with the *Wild and Scenic Rivers Act*, NPS policies, and park goals.
The objectives of this project are to:

- Provide safe vehicular, pedestrian, and bicycle access to Cedar Grove Village in a manner that lessens resource impacts and improves sustainability;
- Provide utilities to the Cedar Grove Village in a safe and sustainable manner;
- Improve the Kings River's ability to flow in a wild and natural course and better protect the river's ORVs;
- Protect other natural and cultural resources in the project area, including floodplains, riparian areas, and wetlands; and
- Protect park facilities downstream of the bridge.

The NPS identified and evaluated a range of alternatives to improve structural bridge deficiencies, improve natural and cultural resources protection, enhance visitor experience, and improve park operations.

The EA evaluates two alternatives, including Alternative A, the no action alternative. Alternative B, the management preferred alternative, includes the replacement of the existing 142-foot bridge with a new 280-foot bridge in the same location. The bridge would have steel girders placed on concrete bridge abutments and two concrete piers, and steel handrails with stone masonry pillars. The bridge would have a concrete deck to accommodate two 11-foot travel lanes and a sidewalk with a curb on the south side. Both roadway approaches would also be reconstructed.

The management preferred alternative includes the installation of a wood reinforced floodplain to restore this reach of the South Fork of the Kings River, which is classified as recreational river, according to the Wild and Scenic Rivers Act. The current bridge length is inadequate and restricts the flow area of the river, particularly during high water and flood events. This has resulted in sediment deposition and erosion upstream of the bridge, altering the natural river channel and fluvial processes. Occasional maintenance and repairs, including bank hardening and the placement of rip rap, has been necessary to protect the bridge. Lengthening the bridge should reduce constriction and improve the natural processes in this reach of the river.

DESCRIPTION OF MANAGEMENT PREFERRED ALTERNATIVE

The management preferred alternative consists of four elements: 1) preparing for demolition, construction, and restoration, 2) removing the existing bridge, 3) constructing the new bridge, and 4) protecting the bridge and restoring the river. These project elements are interrelated and would be undertaken as one project under the management preferred alternative, which is described in detail in the EA. The bridge cross section associated with the preferred alternative would be wider than the existing channel section immediately downstream of the bridge, which would remove the majority of the flow constriction, except for the bridge piers. It would also allow the passage of a 100-year flood. With the current bridge removed and the installation of a reinforced floodplain, the downstream channel geometry would act to constrict the flow rather than the bridge. The management preferred alternative would meet the parks' planning objective of improving the river's ability to flow in a wild and natural course to better protect the river's ORVs as a National Wild and Scenic River. It would also provide a safe, durable, sustainable passage for vehicles, pedestrians, bicycles, and utilities crossing the South Fork of the Kings River at Cedar Grove Lodge.

Construction to replace the Cedar Grove Bridge and restore the South Fork of the Kings River would take place over a two year period starting in late summer or fall. Construction could begin or extend beyond the timeframe identified previously based on weather conditions, but only after the superintendent receives a formal written request and grants permission.

RELATIONSHIP TO PAST AND FUTURE MANAGEMENT ACTIVITIES

A Comprehensive River Management Plan for the Wild and Scenic Rivers in Sequoia and Kings Canyon National Park was completed as part of the general management planning process in 2006. Future road work, bridge construction, and other maintenance activities along the South Fork of the Kings River could impact wild and scenic rivers. The current bridge has an inadequate opening size which constricts the flow area during large flood events. This has caused sediment deposition immediately upstream of the bridge and erosion along the bank upstream of the bridge, altering the natural river channel and fluvial processes (FHWA 2006b).

Past Actions

Past actions include activities that influenced and affected the current conditions of the environment in the vicinity of the project area. These actions primarily include disturbances to the landscape around the Cedar Grove Bridge from the construction of park and concessioner facilities (e.g. Cedar Grove Village), maintenance and repair of the bridge, and maintenance and protection of the Kings Canyon Scenic Byway outside park boundaries. These past actions contributed to both temporary and long-term disturbances to the existing quality of the natural environment. The following past actions were identified near the project area.

Development of the Cedar Grove Area for Public Use

This includes construction of concessioner and park facilities, trails, roads and removal of vegetation in the early to mid-20th century. The Kings Canyon Scenic Byway was also established and is managed by Hume Lake Ranger District of Sequoia National Forest/Giant Sequoia National Monument.

Construction of Bridges on the South Fork of the Kings River

The Lower South Fork of the Kings River Bridge (hereinafter referred to as the Lower Bridge) was constructed in 1950. The bridge has concrete abutments, two piers, a gauging station, and utilities within the bridge structure.

The Cedar Grove Bridge was constructed in 1939. This bridge has concrete abutments and one pier. The west abutment was armored with riprap in 1997.

The Upper South Fork of the Kings River Bridge (hereinafter referred to as the Upper Bridge) was constructed in 1953. The bridge has concrete abutments and one pier.

None of the abutments or piers on the upper and lower bridges is armored with riprap.

Maintenance of Existing Roads, Bridges, and Facilities

The Cedar Grove Bridge has had periodic maintenance to fix the sidewalk/catwalk and wooden decking, to patch holes, and to reconstruct the rail along the road shoulder. Also, past storm events have caused damage to the bridge and resulted in minor work in 1982 and major repair work in 1997.

The Kings Canyon Scenic Byway, adjacent to the South Fork of the Kings River is managed by Hume Lake Ranger District of Sequoia National Forest/Giant Sequoia National Monument. There are various structures and facilities along the road, including a cave open to visitors, trailheads, and parking areas. The road has been protected in many areas by riprap.

Emergency Repairs of Bridges and Roads Due to Past Flooding

The Cedar Grove area has experienced at least nine very large flood events in the past 70 years (1937, 1950, 1955, 1966, 1969, 1978, 1982, 1984, and 1997). During the 1997 flood event log jams formed at both the upper and lower bridges. Park staff removed the debris threatening the bridge piers. In addition, the west abutment of the Cedar Grove Bridge was damaged, the water line under the bridge was broken, and the sewer line was exposed. Park staff reconstructed the western approach to the bridge and armored the abutment.

Current and Future Actions

The following current and reasonably foreseeable future actions were considered in the cumulative effects analysis. Ongoing activities that have the potential to affect resources include the ongoing maintenance of existing roads, bridges, facilities (asphalt patching and striping) and general wear and tear from visitor use. Other activities include roadside brushing, culvert flushing and cleaning, and road striping (cyclic every 2 to 5 years). Chipsealing the road is planned for 2010. Work would occur in June/July 2010 and would be timed to avoid the bridge project. However, there may be some overlap. Utility maintenance projects may also occur.

The Canyon View Campground upstream from the Cedar Grove Bridge is scheduled to be rehabilitated in September of 2009 or 2010. This project would include repairing the road and campsites. This project is scheduled for the fall to reduce impacts on visitors. The project will improve campground facilities and visitor experience. Since the project would be completed in September there would be little effects to the visitor except for an improved campground and experience when the project would be completed.

The implementation of all future projects is contingent on receiving adequate funding.

ANALYSIS OF THE EFFECTS OF THE PROPOSED ACTIVITY

Within-Channel Conditions

The bridge cross section associated with the management preferred alternative would be wider than the existing channel section immediately downstream of the bridge, which would remove the majority of the flow constriction, except for the bridge piers. It would also allow the passage of a 100-year flood.

The installation of the reinforced floodplain would restore the channel to a configuration that more closely resembles the channel geometry in this reach and may reduce the deposition potential upstream of the bridge. It would improve the hydraulic transition into the bridge section (FHWA 2006b).

The demolition of the existing bridge, the construction of the new bridge, and the installation of the reinforced floodplain, which are described in detail above, would require excavation and filling within the channel of the river, causing an increase in turbidity and conductivity. These impacts on water quality would be short-term, minor, and adverse. However, the stabilization of the river banks and the installation of the reinforced floodplain should have a long-term, beneficial impact on water quality.

Riparian and Floodplain Conditions

The management preferred alternative involves the removal of an existing bridge, the construction of a new bridge, and the installation of a reinforced floodplain in the riparian zone and floodplain of the South Fork of the Kings River. The Cedar Grove Bridge crosses the South Fork of the Kings River between the Sentinel Campground and the Cedar Grove Lodge. When the bridge was originally constructed, a significant portion of the channel was filled in to form the left (west) abutment, which has caused a flow constriction at the bridge and an increase in water surface elevations upstream of the bridge. The 100-year floodplain has an average width of 240 feet through the project reach (FHWA 2006a).

As described above, the management preferred alternative would improve the river's ability to flow in a wild and scenic course and would improve the condition of the floodplain, which has become degraded as a result of the existing bridge. The replacement of the existing 142-foot bridge with a 280-foot long bridge would ease the constriction of the channel, improving the overall channel geometry and flow of the river.

Existing vegetation consists of native and non-native grasses, native herbaceous plants, willows, and trees. By installing the reinforced floodplain described above and planting willows on the new restoration, wildlife habitat would be improved and flood energy would be dispersed. The restoration project would also prevent river bank erosion. Other disturbed areas would also be revegetated to match the surrounding native vegetation.

Upland Conditions

The bridge profile grade would be sloped to accommodate the sewer to the lodge on the east side of the bridge. The slope would ensure gravity flow of the sewer. To minimize disturbance and impacts on soils and vegetation outside of the road prism that would be caused by this realignment, a cut on the west approach would be needed. This cut would be gradual, starting just east of the entrance to the Sentinel campground to just short of the bridge. Up to 10 trees may need to be removed to accommodate the cut. If possible, tree wells would be installed to protect the larger diameter trees that would not be removed. The cut bank would be stabilized by a native rock wall varying from approximately one to four feet high.

The cut would require the realignment of the campground multi-use trail approximately fifty feet to the west of the current alignment to ensure a gradual slope to the crosswalk on the road. Approximately ninety linear feet of new multi-use trail would be constructed, and the old path would be removed. It would require that the multi-use trail alignment on the other side of the road be moved to meet the new crosswalk. The multi-use trail realignments would be routed around trees, and the original multi-use trail would be removed and revegetated to match the surrounding vegetation. During construction, a multi-use trail detour would be delineated. All bare ground caused by the abovementioned activities would be revegetated to match the surrounding vegetation.

The removal of up to 10 trees should not result in a significant change in vegetation composition or age structure. Soils would be compacted from equipment, but most of the soil compaction would occur within the prism of the bridge approaches. The changes in upland conditions would not influence archeological, cultural, or other identified significant resource values.

Hydrologic or Biologic Processes

The South Fork of the Kings River is one of the large river systems with headwaters within the parks. The quantity of surface flow follows an annual cycle, with the lowest flows typically occurring in August and the highest flows in May or June. Spring flows are primarily snowmelt from glaciers and snowpack at higher elevations; by late August, the source is primarily groundwater (NPS 2007).

The portions of the Middle and South Forks of the Kings River managed by the NPS begin in glacially-carved lakes above timberline and flow though deep, steep-sided canyons, over falls and cataracts, and eventually come together at the main stem of the Kings River in the Sequoia National Forest (NPS 2007). No recording stream gauges were identified along this reach of the South Fork of the Kings River that could be used to verify the computed flows. The Watershed Modeling System was used to compute the drainage basin and discharges using a US Geological Survey regional regression equation for the Sierra Nevada. The data input to the equation consisted of site specific historic rainfall values from the National Oceanic and Atmospheric Administration (NOAA) Atlas 2, the Precipitation-Frequency Atlas of the Western United States. The drainage basin is approximately 357 square miles (FHWA 2006a). The results of the peak flow discharge computations are in Table 1.

Table 1. USGS Regression Equation Computed Discharges for the South Fork Kings River at Cedar Grove Bridge (FHWA 2006A).

Recurrence Interval (yrs)	Discharge (cfs)
2	1,600
5	3,935
10	5,800
25	9,980
50	13,300
100	18,500
500	33,300

The management preferred alternative is expected to improve the hydrologic processes as compared to the existing bridge. The bridge cross section associated with the preferred alternative would be wider than the existing channel section immediately downstream of the

bridge, which would remove the majority of the flow constriction, except for the bridge piers. It would also allow the passage of a 100-year flood.

The removal of the existing bridge, the construction of the new bridge, and the installation of the reinforced floodplain would require the construction of a temporary access route to the stream to allow equipment access to the abutments, the piers, and the reinforced floodplain area. This may involve adding fill material to the riverbank and streambed. Work on the west side abutment would include the removal of approximately 350 cubic yards of material. Water would also be diverted around the construction area, resulting in a temporary change in hydrologic processes. The access route and the water diversion would only be construction related and would be removed upon completion of the project, allowing the river to flow unimpeded.

The construction of the new piers would continue to result in scour around the piers. However, this would not be significantly different than the scour around the existing pier.

The management preferred alternative would have short-term adverse effects on streamside vegetation, wildlife, fish, and nutrient cycling due to construction disturbance. However, the revegetation of the reinforced floodplain and the river banks should provide additional streamside vegetation and habitat for wildlife having long-term, beneficial effects.

Magnitude and Spatial Extent of Potential Off-Site Changes

Very few other projects are planned in the Cedar Grove Area. As stated in the Relationship to Past and Future Management Activities section, most of the projects that would be done in the Cedar Grove area include routine maintenance and repair. The rehabilitation of the Canyon View campground upstream from the Cedar Grove Bridge would be the largest project in the near future. None of these projects would have a significant impact or change that would influence other parts of the river system.

In the EA cumulative effects analysis for water quality and hydrology and streamflow characteristics, it was determined that these off-site projects would have short-term, minor, adverse impacts on these resources, which would contribute slightly to the overall, adverse cumulative effects of the project.

Time Scale the Previous Sections are Likely to Occur

The project work would be completed over the course of two seasons. In-water work would be done during low flow. In this case, low flow is defined as anything less than the ordinary high water mark (OHWM). The two-year flood delineation is being used as a rough estimate of the OHWM for this project. A two-year flood is the level of flood water expected to be equaled or exceeded every two years on average. Low flow periods generally occur in August and September.

Compare Project Analyses to Management Goals

Management objectives for the South Fork of the Kings River Wild and Scenic River are provided in the Sequoia and Kings Canyon National Parks Final General Management Plan and Comprehensive River Management Plan/Environmental Impact Statement (FGMP/EIS) (NPS 2007).

The parks' final FGMP/EIS provides the following direction relative to the Cedar Grove Area transportation infrastructure and the South Fork of the Kings River:

- Protect the free-flowing character of the river areas

- Assess river, floodplain, wetland, and riparian areas – Maintain and enhance the integrated ecological functions to protect and enhance the natural hydrologic and free-flowing condition of the rivers
- Replace Cedar Grove Village Bridge (and other bridges as needed), with replacement locations assessed for less resource impacts and improved sustainability (NPS 2007).

The management preferred alternative would replace the Cedar Grove Village Bridge and in doing so, would improve the free-flowing character of the river. The installation of the reinforced floodplain would reduce river bank erosion along the west bank of the river and also improve the free-flowing character of the river by stabilizing the river channel.

SECTION 7(A) DETERMINATION

Impact Intensity and Description

Negligible:	Impacts would be barely detectable to most visitors and would have no discernible effect on a river's free-flowing character and ORVs.
Minor:	Impacts would be slightly detectable to some visitors but are not expected to have an overall effect on a river's free-flowing character and ORVs.
Moderate:	Impacts would be clearly detectable by many visitors and could have an appreciable effect on a river's free-flowing character and ORVs.
Major:	Impacts would have a substantial and noticeable effect on most visitors or the river's free-flowing character and ORVs.

Duration

Short-term – impacts occurring during, immediately following, and up to a year after construction

Long-term – impacts taking more than one year to recover

ALTERNATIVE B: NPS MANAGEMENT PREFERRED ALTERNATIVE

Impacts on free-flowing character

Impact of existing bridge removal

Under the management preferred alternative, the removal of the steel beams below the bridge deck, abutments, wingwalls, and piers would require the temporary diversion of the river on each side of the channel upstream and below the bridge. These measures would temporarily restrict flow, resulting in short-term, moderate adverse impacts on the free-flowing character of the river.

Impact of new bridge construction

The construction of the new bridge would require the temporary diversion of the river, reducing its free-flowing nature as stated above. After construction is completed, the bridge cross section would be wider than the existing channel section, which would remove the majority of the flow constriction, except for the bridge piers. This would allow for a more free-flowing condition than the previous conditions as well as passage of a 100-year flood, resulting in long-term beneficial effects in the project area.

Bridge protection and river restoration

During the restoration project, the river would be diverted as described above. Construction would occur during low flow, and mitigation would further reduce impacts. The excavation of the depositional area, relocation of the material to the highly-eroded area along the west

bank of the river, and installation of the reinforced floodplain would stabilize the river bank, protect the existing floodplain downstream of the bridge location, increase channel roughness to reduce flow velocities, and realign the channel to a more natural course (FHWA 2006a).

The in-stream work during the existing bridge removal, new bridge construction, and bridge protection and river restoration would result in short-term, moderate adverse impacts on the free-flowing character of the river, and long-term, beneficial effects to the free-flowing character due to the replacement of the existing bridge with a longer bridge. The longer bridge would allow the river to flow more freely through the bridge section than the existing bridge. The reinforced floodplain would have a long-term beneficial effect by restoring natural hydrologic processes in the river.

Impacts on ORVs

Scenic

Impact of existing bridge removal
The removal of the existing bridge would cause local impacts on the river's scenic ORV from construction disturbance in the project area. These impacts would be local, short-term, minor to moderate, and adverse. Because these impacts would be short-term, they would not intrude on or unreasonably diminish the scenic ORV present in the area once the project is completed.

Impact of new bridge construction
The construction of the new bridge would cause local, short-term, minor to moderate, adverse impacts on the river's scenic ORV from construction disturbance. The new bridge is larger and more complex than the existing bridge, causing a long-term, moderate, adverse impact on the scenic ORV of the river. This effect would be localized and would not have a segment-wide effect. Though the effect would be adverse, it would not intrude on or unreasonably diminish the scenic ORV present in the area because it is replacing an existing bridge, and would be offset by the improved free-flow of the river resulting from the project.

Bridge protection and river restoration
The protection of the bridge and installation of the reinforced floodplain would cause local, short-term, minor to moderate, adverse impacts on the river's scenic ORV from construction disturbance. To minimize long-term adverse impacts, the abutment slopes would be covered with material that would be similar to the existing cobble of the riverbed. The reinforced floodplain would serve to stabilize the river channel, and eliminate the eroded west bank. The disturbed area and reinforced floodplain would be revegetated, and would eventually (1 to 2 growing seasons) blend in with the surrounding landscape, and would result in long-term beneficial effects on the scenic ORV.

Geologic Processes/Conditions

Impact of existing bridge removal, new bridge construction, and bridge protection and river restoration
The removal of the existing bridge, the construction of the new bridge and bridge protection and river restoration would cause local impacts on the river's geologic ORV from construction disturbance around the project area. Given that the channel is largely gravel and cobbles, the use of heavy equipment would likely alter the channel bottom only slightly in the sections it traverses. The river banks would be revegetated upon completion of the

construction. These impacts would be local, short-term, negligible adverse and would not intrude on or unreasonably diminish the geologic ORV.

Recreation

Impact of existing bridge removal, new bridge construction, and bridge protection and river restoration

The removal of the existing bridge, the construction of the new bridge and bridge protection and river restoration would cause local, short-term minor adverse impacts on the river's recreational ORV from bridge and instream closures related to construction at the project area. There would be other opportunities for visitors to continue to access the river outside the project limits.

The replacement of the bridge would provide a long-term, safe, durable, sustainable passage for vehicles, pedestrians, and bicycles crossing the South Fork of the Kings River at Cedar Grove Village providing a localized, long-term beneficial effect on recreation ORVs.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions with the potential to affect the river include past and future road and bridge maintenance, emergency stabilization, the existence of other bridges on the designated wild and scenic river corridor, and the past placement of riprap on the road corridor outside of the park boundary. These actions have affected the free-flowing character and ORVs of the river as stated under the no action alternative.

The management preferred alternative would result in short-term minor to moderate adverse effects on the free-flowing character and ORVs as a result of construction actions, but in the long-term, would result in beneficial effects to the free-flowing character and ORVs from an increased bridge span, reduced maintenance, and by restoring the natural hydrologic function of the river with the placement of the wood reinforced floodplain. However, some would argue the presence of any bridge on a wild and scenic river results in a minor to moderate adverse effect on the scenic ORV. Overall, the management preferred alternative would result in short-term moderate adverse cumulative effects and long-term moderate adverse and beneficial cumulative effects to the free flowing character and ORVs.

Conclusion. The management preferred alternative would have short-term, moderate, adverse impacts on the free-flowing character and ORVs of the river from the project work. There would be long-term, moderate, adverse impacts on the scenic ORV from the continued existence of the bridge on the river. The management preferred alternative would result in localized, long-term, beneficial effects to the free-flowing condition of the river as a result of installing a longer bridge, and long-term beneficial effects on recreation ORVs by provide safe passage across the bridge. Cumulative effects would be short-term moderate adverse to the free flowing character and ORVs, and long-term moderate adverse and beneficial.

Because there would be no major, adverse impacts on wild and scenic rivers, there would be no impairment of park resources and values. Because the impacts previously described (1) are not inconsistent with the park's purpose and values, (2) do not prevent the attainment of desired future conditions for natural and cultural resources, (3) do not create an unsafe environment, (4) do not diminish opportunities for future enjoyment of the park, and (5) do not unreasonably interfere with park programs or activities, an appropriate use, or concessioner or contractor operations, there would be no unacceptable impacts on wild and scenic rivers under the management preferred alternative.

Mitigation Measures

General Measures

- Construction limits would be identified with construction tape or similar material prior to any construction activity. Workers would be instructed to avoid conducting activities and disturbing areas beyond the construction limits.
- All tools, equipment, barricades, signs, surplus materials, demolition debris and rubbish would be removed from the project work limits upon project completion. Any asphalt surfaces damaged during the project would be repaired to its original condition.
- Contractors would be required to properly maintain construction equipment and generators (i.e., mufflers) to minimize noise from use of the equipment.
- All equipment on the project would be maintained in a clean and well-functioning state to avoid or minimize contamination from automotive fluids. All equipment would be checked daily.
- Materials would be stored, used, and disposed in a proper manner.
- A hazardous spill plan would be approved by the park prior to construction. This plan would state what actions would be taken in the case of a spill, notification measures, and preventive measures to be implemented, such as the placement of refueling facilities, storage, and handling of hazardous materials, etc.
- To reduce the potential for cement spills, a confined area with appropriate containment and erosion control measures would be designated in one of the staging areas for washing out cement trucks.
- Where appropriate and available "environmentally friendly" grease, hydraulic oil, and bar and chain oil would be used. These lubricants are vegetable or mineral oil based, less toxic and biodegradable.
- Best management practices (BMPs) for drainage and sediment control would be implemented to prevent or reduce nonpoint source pollution and minimize soil loss and sedimentation in drainage areas. BMPs would include all or some of the following actions, depending on site-specific requirements:
- Disturbed areas would be kept as small as possible to minimize exposed soil and the potential for erosion;
- Waste, and excess excavated materials would be stored outside of drainages to avoid sedimentation. Silt fences, temporary earthen berms, temporary water bars, sediment traps, stone check dams, or other equivalent measures would be installed around the perimeter of stockpiled fill material;
- Regular site inspections would occur during construction to ensure that erosion-control measures were properly installed and are functioning effectively.
- A portable holding basin would be utilized at the concrete batch plant to contain waste from cleaning out the concrete trucks.

Water Quality, Hydrology and Stream Flow Characteristics

- All work in the streambed would be performed during periods of low flow, generally from late summer through early fall.
- Prior to working in the stream, the stream flow would be diverted around the work area. Temporary sediment traps, erosion check screens, coffer dams, water-inflated coffer dams (a re-useable water inflated dam – a single tube devise with internal

support for stability) and/or filters would be used to divert the main flow and reduce turbidity downstream from the project site. All in-stream devices would be removed between construction seasons and disturbed areas would be stabilized to prevent erosion. Diversions would be constructed in a manner that would provide a continuous flow to downstream reaches.

- Temporary work pads consisting of onsite alluvium, clean silt-free gravel, or river rock would be built for large stationary equipment working in the stream channel to provide a stable substrate.
- All heavy equipment operated in the stream channel would drive slowly and carefully to minimize sediment movement and resulting increased turbidity.
- At all upland cut and fill areas, erosion and sedimentation control measures would be implemented to minimize impacts on water quality. These measures would remain until final site stabilization (all soil disturbing activities at the site have been completed and that a uniform perennial vegetative cover with a density of at least 70% of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed).
- Water needed for construction and dust control would come from the existing developed water systems within the parks and would not be diverted from surface waters.
- The sewer lines would be encased in the appropriate grade sleeve, according to state regulations, to protect the lines and prevent any potential leakage from impacting water quality. Upon relocation, all utility lines would be monitored regularly to ensure all lines are operational.

Wild and Scenic Rivers

- To preserve the aesthetic qualities of the scenic river, the cut bank on the west approach to the bridge would be stabilized by a native rock wall.
- To maintain a consistent appearance between the bridge and the walkway and minimize the visual contrast of the bridge, the retaining wall on the east side of the wall would be covered with a rock veneer.
- Any riprap placed on the soil surface would consist of materials that blend with the surrounding landscape.

Floodplains/Wetlands

- Floodplain and wetland protection BMPs outlined in Appendix F would be adhered to, thus limiting impacts on wetlands and floodplains.

Vegetation, Non-Native Species, and Soils

- A plant survey would be done prior to project construction to determine the presence of rare plants. If rare plants are found, they would be relocated if possible, as determined by park botanist.
- A revegetation plan would be developed for the purposes of restoring native vegetation to the project site, minimizing erosion, and stabilizing the bank and disturbed areas.
- Riparian vegetation would be planted as soon as possible to minimize sedimentation associated with bare ground. A primary revegetation technique for willows would be cutting and planting willow stakes. This would be done concurrently with the contractor's placement of riprap to allow the stakes to be placed between cracks in the rock. Other types of vegetation would also be planted, such as cottonwoods and pines, where appropriate.
- Topsoil would be removed if appropriate as determined by the park botanist, from areas of construction and stored for later use. After project completion, ground surface treatment may include grading to natural contours, replacing topsoil, incorporating native litter and duff layer over salvaged topsoil and, where necessary, seeding and planting.
- Reclaimed areas would be monitored after construction to determine if reclamation efforts are successful or if additional remedial actions are necessary. Remedial actions may include installation of erosion-control structures, reseeding, topsoil placement, and/or replanting the area, hand-pulling, and controlling non-native plant species with herbicide.
- In an effort to avoid introduction of non-native/noxious plant species, no hay or straw bales would be used during revegetation or for temporary erosion control.
    - All construction equipment would be pressure washed/steam cleaned prior to entering the parks to ensure that all equipment and machinery are weed free. Construction equipment would be inspected by NPS staff prior to entering the parks to ensure compliance with cleanliness requirements. Inadequately cleaned equipment would be rejected.
    - All haul trucks bringing fill materials (excluding asphalt) from outside the parks would be covered to prevent seed transport and dust deposition along the road corridor.
    - Equipment and disturbance would be limited to within the construction limits, and to roadsides, bridge areas, and staging areas
    - All fill, rock or additional topsoil needed for project work would be obtained from NPS approved weed free sources. If weed free quarry sources cannot be located, the contractor would be required to scrape away topsoil at the quarry and/or acquire freshly exposed material with minimal seed deposition and washing of coarse materials (rip rap).
    - Disturbed areas would be monitored for up to three years following construction to identify growth of noxious weeds or non-native vegetation. Treatment of non-native vegetation would be completed in accordance with NPS 77-7, Integrated Pest Management Manual.

Visitor Experience and Health and Safety

- Visitors, park and concessioner employees, and others would be notified when road closures or traffic delays would occur. Information on the project schedule would be provided to neighboring communities, on the park website, at visitor centers and entrance stations.
- The bridge would be closed during construction to protect park visitors and employees. Signs and construction fencing would be used to prevent entry and crossings by visitors. The North Side Road would be used as a detour for the Cedar Grove Lodge during this time.
- Signs would be posted at the Lewis Creek Trailhead Parking Area to warn people to use caution during the detour.

Wildlife

- Construction activities would be limited to daylight hours with the exception of when water and sewer would be transferred, which could occur at night.
- To reduce noise disturbance and limit impacts on breeding avian and mammalian species, all tree removal work would be done in the fall or early spring, if possible. If trees with a dbh of 24 inches or greater need to be removed outside of this time frame, trees would be identified for removal and evaluated for nesting activity by a park biologist. If nesting is found, the tree would be left in place or removed outside of the breeding season.
- Feeding or approaching wildlife would be prohibited by construction personnel.
- Wildlife collisions would be reported to park personnel.
- Park biologist or ranger would be notified if bears loiter in the area and appropriate response would be provided.
- A litter control program would be implemented during construction to eliminate the accumulation of trash. All food would be stored in bear proof containers except when it is being consumed. Food stored in vehicles would be in bear proof containers. Spilled food would be cleaned up. Food related garbage would be removed from the project area daily and taken to an animal resistant dumpster within the park.

Air Quality

- Dust control would occur, as needed, on active work areas where dirt or fine particles are exposed.
- The contractor would not leave vehicles idling for more than five minutes when parked or not in use.
- Asphalt plants would be located outside the parks. Small quantities of asphalt may be stored for a short-term at designated staging areas.

Cultural Resources

- The park archeologist would monitor initial ground disturbing activities outside of the river channel.
- Should any archeological resources be uncovered during construction, work would be halted in the area and the park archaeologist, Office of Archeology and Historic Preservation (OAHP), and appropriate Native American Tribes would be contacted for further consultation.

- Park cultural resources staff would be available during construction to advise or take appropriate actions should any archeological resources be uncovered during construction.
- In the unlikely event that human remains are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (1990) would be followed.
- The NPS would ensure that all contractors and subcontractors are informed of the penalties for illegally collecting artifacts or intentionally damaging archeological sites or historic properties. Contractors and subcontractors also would be instructed on procedures to follow in case previously unknown archeological resources are uncovered during construction.

Section 7(a) Determination

Provided the above requirements are fully and completely implemented for the duration of the project, and the project meets water quality requirements, pursuant to Section 7(a) of the Wild and Scenic Rivers Act, the NPS has determined, on behalf of the Secretary of the Interior, that this project would not have a direct and adverse effect on the free-flowing character and ORVs of the South Fork of the Kings Wild and Scenic River.

Any changes to any elements of the project or the scheduling of in-stream work, as described in the package submitted for evaluation and/or above, would require consultation with the NPS and may require additional Section 7(a) review/approvals.

REFERENCES

Federal Highway Administration
———.2006a. Memorandum: Kings River Cedar Grove Village Bridge Replacement – Bridge Configuration Review. On file at the Denver Service Center, National Park Service.

———.2006b. Bridge Inspection Report Summary, Cedar Grove Bridge. On file at the Denver Service Center, National Park Service.

Interagency Wild and Scenic Rivers Coordinating Council. 1997. Section 7 Technical Report. Available on the Internet: http://www.rivers.gov/publications/section-7.pdf, National Park Service, U.S. Department of Interior

National Park Service.
———. 2009. Environmental Assessment for the Bridge Replacement at Cedar Grove Bridge. Sequoia and Kings Canyon National Parks, California.
———. 2007 Final General Management Plan/Environmental Impact Statement. Sequoia and Kings Canyon National Parks.

———. 2006 NPS *Management Policies*. U.S. Department of the Interior, National Park Service.

United States Code (USC). 16 USC §§ 1271 et seq. *Wild and Scenic Rivers Act* (October 2, 1968).

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STATEMENT OF FINDINGS FOR EXECUTIVE ORDER 11988

(FLOODPLAIN MANAGEMENT)

BRIDGE REPLACEMENT AT CEDAR GROVE

SEQUOIA AND KINGS CANYON NATIONAL PARKS

CALIFORNIA

Recommended:

_____

Superintendent, Sequoia and Kings Canyon National Parks Date

Certified for Technical Adequacy and Servicewide Consistency:

_____

Water Resources Division Date

Concurrence:

_____

Regional Safety Officer Date

Approved:

_____

Pacific West Regional Director Date

INTRODUCTION

The National Park Service (NPS) in cooperation with the Federal Highway Administration/Central Federal Lands Highway Division (FHWA) is proposing to replace the 142-foot bridge spanning the South Fork of the Kings River at Cedar Grove Village in Sequoia and Kings Canyon National Parks (parks), Fresno County, California. This evaluation is consistent with the following requirements and guidelines: Executive Order 11988 ("Floodplain Management"), NPS Director's Order #77-2 Floodplain Management (NPS 2003), and NPS Procedural Manual #77-2: Floodplain Management (NPS 2002).

This Statement of Findings (SOF) summarizes the floodplain development associated with actions included in the management preferred alternative as described and evaluated in the *Draft Environmental Assessment for the Bridge Replacement at Cedar Grove* (EA) (NPS 2009).

DESCRIPTION OF THE PROPOSED ACTION

Purpose

In its current condition, the bridge does not provide a safe, durable, sustainable passage for vehicles at Cedar Grove, is unsafe for pedestrians and bicycles, and restricts the free-flowing character of the South Fork of the Kings River, particularly during high water and flood events.

The purpose of this project is to maintain and enhance access for visitors, park employees, and concessioners in the Cedar Grove area, in a safe and sustainable manner.

The second purpose of this project is to meet the mandates of the Wild and Scenic Rivers Act (16 U.S.C. 1271 et seq.). The 7.6-mile segment of the South Fork of the Kings River, including the project area, is a designated Wild and Scenic River, classified as a recreational river segment. In accordance with the Wild and Scenic Rivers Act, this area will be administered in such a manner as to protect and enhance the values that caused it to be included, without limiting other uses that do not substantially interfere with public use and enjoyment of these values. NPS *Management Policies* directs the parks to take no management actions that could adversely affect the values that qualify a river for the national wild and scenic rivers system (4.3.4) (NPS 2006).

The final purpose of this project is to implement a component of the approved FGMP/EIS for the parks. The FGMP/EIS calls for the replacement of the Cedar Grove Village Bridge to reduce impacts and increase sustainability (NPS 2007).The FGMP/EIS directs the parks to protect the free-flowing character of river areas and to maintain and enhance the integrated ecological functions, natural hydrological, and free-flowing condition of park rivers.

Need

The need for the action is to reconstruct the bridge in a manner that would improve sustainability and meet standard weight requirements, to continue to provide for visitor and park access, while protecting and enhancing the values of the Cedar Grove Bridge, in accordance with the *Wild and Scenic Rivers Act*, NPS policies, and park goals.

The objectives of this project are to:

- Provide safe vehicular, pedestrian, and bicycle access to Cedar Grove Village in a manner that lessens resource impacts and improves sustainability;
- Provide utilities to the Cedar Grove Village in a safe and sustainable manner;
- Improve the Kings River's ability to flow in a wild and natural course and better protect the river's ORVs;
- Protect other natural and cultural resources in the project area, including floodplains, riparian areas, and wetlands; and
- Protect park facilities downstream of the bridge.

Photo 3. Existing Cedar Grove Bridge

The NPS identified and evaluated a range of alternatives to improve structural bridge deficiencies, improve natural and cultural resources protection, enhance visitor experience, and improve park operations.

The EA evaluates two alternatives, including Alternative A, the no action alternative. Alternative B, the management preferred alternative, includes the replacement of the existing 142-foot

bridge with a new 280-foot bridge in the same location. The bridge would have steel girders placed on concrete bridge abutments and two concrete piers, and steel handrails with stone masonry pillars. The bridge would have a concrete deck to accommodate two 11-foot travel lanes and a sidewalk with a curb on the south side. Both roadway approaches would also be reconstructed.

The management preferred alternative would also include the installation a wood reinforced floodplain to restore this reach of the South Fork of the Kings River, which is classified as a recreational river, according to the Wild and Scenic Rivers Act. The current bridge length is inadequate and restricts the flow area of the river, particularly during high water and flood events. This has resulted in sediment deposition and erosion upstream of the bridge, altering the natural river channel and fluvial processes (Figure 1). Occasional maintenance and repairs, including bank hardening and the placement of rip rap, has been necessary to protect the bridge. Lengthening the bridge and removing the hardened materials from the embankment should reduce constriction and improve the natural processes in this reach of the river.

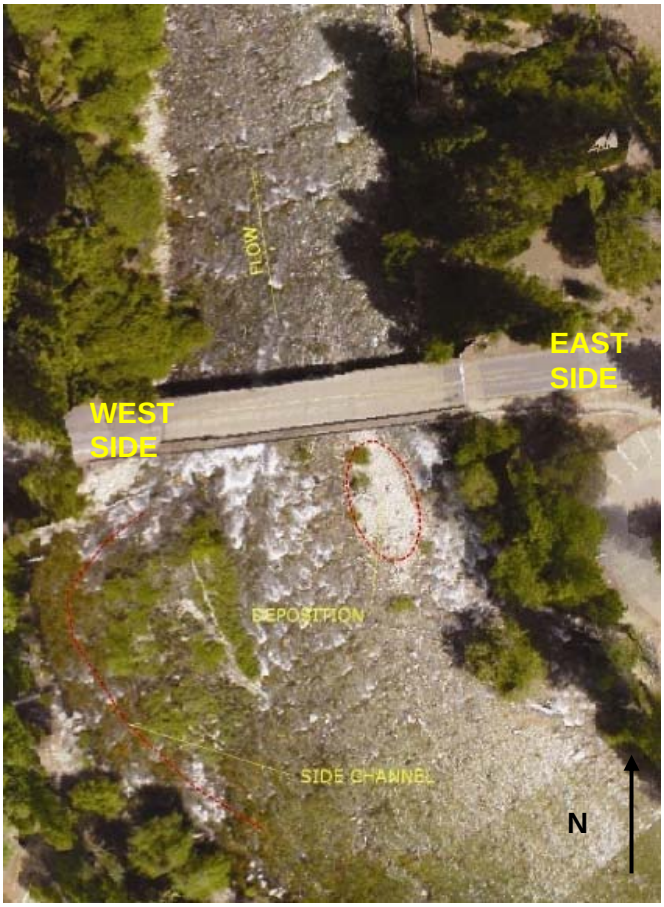

Figure 8. Aerial view of Cedar Grove Bridge (FHWA 2006a)

The removal of the existing bridge, the construction of the new bridge, and the installation of the reinforced floodplain would require some excavation and filling in the floodplain of the South Fork of the Kings River (Table 1).

Table 1. Volume of fill and riprap to be excavated as well as placed in the floodplain (FHWA, Karl Eikermann pers. comm. 2009, ENTRIX 2009).

Activity	Excavation Volume (yd^3)	Fill Volume (yd^3)	Net Removal (yd^3)	Net Fill Volume (yd^3)	Area of new disturbance (yd^2)
Construction (pier and abutment removal and construction, riprap construction, temporary riprap work pad)	1,405	1,205	200	__	880
Restoration (reinforced floodplain)	2,000	2,770	__	770	In disturbed part of the river caused by bridge constrict-ion
TOTAL	3,405	3,975	200	770	880

Floodplain Extent

The Cedar Grove Bridge crosses the South Fork of the Kings River between the Sentinel Campground and the Cedar Grove Lodge. When the bridge was originally constructed, a significant portion of the channel was filled in to form the left (west) abutment, which has caused a flow constriction at the bridge and an increase in water surface elevations upstream of the bridge. The 100-year floodplain has an average width of 240 feet through the project reach (FHWA 2006a).

General Characteristics of Flooding in the Area

No recording stream gauges were identified along this reach of the South Fork of the Kings River that could be used to verify the computed flows. The Watershed Modeling System was used to compute the drainage basin and discharges using a US Geological Survey regional regression equation for the Sierra Nevada. The data input to the equation consisted of site specific historic rainfall values from the National Oceanic and Atmospheric Administration (NOAA) Atlas 2, the Precipitation-Frequency Atlas of the Western United States. The drainage basin is approximately 357 square miles (FHWA 2006). The results of the peak flow discharge computations are in Table 2.

Table 2. USGS Regression Equation Computed Discharges for the South Fork Kings River at Cedar Grove Bridge (FHWA 2006).

Recurrence Interval (yrs)	Discharge (cfs)
2	1,600
5	3,935
10	5,800
25	9,980
50	13,300
100	18,500
500	33,300

According to park records, the South Fork of the Kings River at Cedar Grove has experienced 50-year flow events nine times in the past 70 years (1937, 1950, 1955, 1966, 1969, 1978, 1982, 1984, and 1997). The constriction created by the embankments and the pier has resulted in alterations of the stream channel under and immediately upstream of the bridge. These alterations include the formation of a new side channel on the west upstream side of the bridge and the formation of a depositional area in the main channel of the river. The flood damage in the 1955 and 1997 floods required significant quantities of fill and riprap material to repair damage done to the west embankment during the 1955 and 1997 floods (NPS, Austin, pers. comm. 2008).

JUSTIFICATION FOR USE OF THE FLOODPLAIN

Two other alternatives were considered but dismissed during the scoping process. One design option considered and dismissed allowed for the removal of the existing bridge and replacement with a 330-foot long bridge. This alternative would improve the river's ability to flow in a wild and natural course, to better protect the river's ORVs as a National Wild and Scenic River and provide a safe, durable, sustainable passage for vehicles, pedestrians, bicycles, and utilities crossing the South Fork of the Kings River at Cedar Grove Village. However, the construction of a 330-foot bridge would not provide greater hydraulic benefit than the construction of the 280-foot bridge (NPS Water Resources Division, Smillie and FHWA/CFLHD, Hogan, pers. comm. 2009) nor would it meet the project objectives better than the 280-foot bridge. Thus, the construction of the 330-foot long bridge would be very similar to the less expensive 280-foot bridge alternative and, as a result, has been dismissed from further analysis. This alternative would have had the same impacts on floodplains as the proposed action.

The second alternative considered but dismissed allowed for the improvement of the North Side Road, including the west intersection. Many improvements would be made to the North Side Road, including the improvement of the turning radius at the west end where it joins the Kings Canyon Scenic Byway. The road would need to be widened to

two lanes to better accommodate larger vehicles, such as RVs and vehicles with trailers. This widening would cause adverse impacts on wetlands. Low spots subject to flooding would also be raised, the shoulder hardened as required, and the surface paved for its entire length. The improvement of the turning radius at the west end where it intersects the Kings Canyon Scenic Byway would require removal of the rock face adjacent to the road, potentially resulting in an unstable slope, which may lead to more landslides and result in increased maintenance needs. A trail bridge would also be built across the river to provide passage for pedestrians, bicycles, and utilities after the demolition of the existing bridge. The road improvements proposed in this alternative would eliminate the need for the bridge at Cedar Grove Village. However, this alternative would not meet the project objective to provide safe, durable, sustainable passage for vehicles, and would also not be consistent with the direction of the FGMP/EIS, which specifically states that Cedar Grove Village bridge should be replaced (FGMP/EIS 2006), and would not be economically feasible. Therefore, this alternative was dismissed from further analysis. This alternative would have had similar impacts as the road bridge to floodplains resulting from the building of a trail bridge.

With the current bridge and west embankment removed, the downstream channel geometry would act to constrict the flow rather than the bridge. Since the 280-foot bridge configuration would span most of the floodplain, there would be no constriction scour. In addition, since the abutments would be buried and would not constrict the channel, no abutment scour would be anticipated and the hydraulic conditions of the river would be improved (FHWA 2006a). The construction of the new bridge would have scour from two piers.

The depositional area would be excavated and deposited upstream of the bridge filling in the eroded portion of the channel that has formed along the west bank. This would help to restore the channel to a configuration that more closely resembles the typical channel geometry in this reach and may also reduce the deposition potential upstream of the bridge. The abovementioned restoration activities would also help restore the channel configuration and improve the hydraulic conditions of the river (FHWA 2006a).

DESCRIPTION OF SITE-SPECIFIC FLOOD RISK

The 280-foot bridge would be wider than the natural channel section immediately downstream of the bridge allowing for natural stream flow passage to occur as well as passage of a 100-year flood. The 280-foot span would not constrict the flow of the channel. With the current bridge removed, the downstream channel geometry would act to constrict the flow rather than the bridge, allowing for a smooth transition beneath the bridge. For the 50-year event, the 280-foot bridge would lower the upstream water surface elevation by approximately 1 foot, while the reduction for a 100-year event is nearly 2 feet (FHWA 2006a).

DESIGN OR MODIFICATIONS TO MINIMIZE HARM TO FLOODPLAIN VALUES

Natural floodplain values include attributes of floodplains that contribute to ecosystem quality such as soils, vegetation, wildlife habitat, dissipation of flood energy, sedimentation processes, and groundwater discharge. The proposed bridge would improve the hydrology of this reach of the South Fork of the Kings River by decreasing contraction and abutment scour and lowering the upstream water surface elevation by 1 foot for a 50-year event and 2 feet for a 100-year event. By installing the reinforced floodplain described in the EA and planting willows and other native species, such as cottonwoods, on the new restoration, fish and wildlife habitat would be improved and flood energy would be dispersed. The restoration project would also prevent bank erosion.

Conclusion

The preferred alternative would improve the river's ability to flow freely and would improve the condition of the floodplain, which has become degraded as a result of the existing bridge. The replacement of the existing 142-foot bridge with a 280-foot long bridge would ease the constriction of the channel, improving the overall channel geometry and flow of the river. The reinforced floodplain and restoration of more natural river conditions would improve habitat and reduce flood energy by dispersion. The restoration project would also prevent bank erosion.

NPS has determined that the proposed actions associated with the preferred alternative as described in the EA (NPS 2009) would have no significant effect on human health or property or on natural or beneficial floodplain values. Mitigation and compliance with regulations and policies to prevent impacts on water quality, floodplain values, and loss of property or human life would be strictly adhered to during and after the construction. Individual permits with other federal, state and local agencies would be obtained prior to construction activities. No long-term adverse impacts on floodplains would occur from the preferred alternative. Therefore, NPS finds the preferred alternative to be consistent with Executive Order 11988 for the protection of floodplains.

References

Austin, J.T. (NPS, Sequoia and Kings Canyon National Parks).
2008 Personal communication: Email attachment Cedar Grove Bridge Background dated November 20, 2008.

Eikermann, K. (FHWA, CFLHD)
2009 Personal communication: Email attachment with itemized list of fill and excavation needs for the Kings River Bridge project, Sequoia and Kings Canyon National Parks dated January 28, 2009.

Federal Highway Administration
2006a Memorandum: Kings River Cedar Grove Village Bridge Replacement – Bridge Configuration Review. On file at the Denver Service Center, National Park Service.

2006b Bridge Inspection Report Summary, Cedar Grove Bridge. On file at the Denver Service Center, National Park Service.

U.S. Department of Interior, National Park Service
2009 *Environmental Assessment for the Bridge Replacement at Cedar Grove.* Sequoia and Kings Canyon National Parks, Tulare County, California.

2007 *Final General Management Plan/Environmental Impact Statement*. Sequoia and Kings Canyon National Parks, Tulare County, California.

2003 *NPS Director's Order #77-2 Floodplain Management.* Washington, D.C.

2002 *NPS Procedural Manual #77-2 Floodplain Management.* Washington, D.C.

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The following serve as BMPs for NPS actions that may have adverse impacts on wetlands. Additional BMPs may be appropriate depending on local conditions or special circumstances. These also serve as "conditions" that must be met for the actions listed in Section 4.2 A of these procedures to qualify as "excepted."

1. **Effects on hydrology:** Action must have only negligible effects on site hydrology, including flow, circulation, velocities, hydroperiods, water level fluctuations, and so on.

2. **Water quality protection and certification:** Action is conducted so as to avoid degrading water quality to the maximum extent practicable. Measures must be employed to prevent or control spills of fuels, lubricants, or other contaminants from entering the waterway or wetlands. Action is consistent with state water quality standards and Clean Water Act Section 401 certification requirements (check with appropriate agency).

3. **Erosion and siltation controls:** Appropriate erosion and siltation controls must be maintained during construction, and all exposed soil or fill material must be permanently stabilized at the earliest practicable date.

4. **Effects on fauna:** Action must have only negligible effects on normal movement, migration, reproduction, or health of aquatic or terrestrial fauna, including at low flow conditions.

5. **Proper maintenance:** Structure or fill must be properly maintained so as to avoid adverse impacts on aquatic environments or public safety.

6. **Heavy equipment use:** Heavy equipment use in wetlands must be avoided if at all possible. Heavy equipment used in wetlands must be placed on mats, or other measures must be taken to minimize soil and plant root disturbance and to preserve preconstruction elevations.

7. Stockpiling material: Whenever possible, excavated material must be placed on an upland site. However, when this is not feasible, temporary stockpiling of excavated material in wetlands must be placed on filter cloth, mats, or some other semipermeable surface, or comparable measures must be taken to ensure that underlying wetland habitat is protected. The material must be stabilized with straw bales, filter cloth, or other appropriate means to prevent reentry into the waterway or wetland.

8. **Removal of stockpiles and other temporary disturbances during construction:** Temporary stockpiles in wetlands must be removed in their entirety as soon as practicable. Wetland areas temporarily disturbed by stockpiling or other activities during construction

must be returned to their pre-existing elevations, and soil, hydrology, and native vegetation communities must be restored as soon as possible.

9. **Topsoil storage and reuse:** Revegetation of disturbed soil areas should be facilitated by salvaging and storing existing topsoil and reusing it in restoration efforts in accordance with NPS policies and guidance. Topsoil storage must be for as short a time as possible to prevent loss of seed and root stability, loss of organic matter, and degradation of the soil microbial community.

10. **Native plants:** Where plantings or seeding are required, native plant material must be obtained and used in accordance with NPS policies and guidance. Management techniques must be implemented to foster rapid development of target native plant communities and to eliminate invasion by exotic or other undesirable species.

11. **Boardwalk elevations:** Minimizing shade impacts, to the extent practicable, should be a consideration in designing boardwalks and similar structures. (Placing a boardwalk at an elevation above the vegetation surface at least equal to the width of the boardwalk is one way to minimize shading.)

12. **Wild and Scenic Rivers:** Action cannot be “excepted” (see Section 4.2 of these procedures) if proposed in a component of the National Wild and Scenic River System or in a river officially designated by Congress as a “study river” for possible inclusion in the system while the river is in official study status.

13. **Coastal zone management:** Action must be consistent, to the maximum extent practicable, with state coastal zone management programs.

14. **Endangered species:** Action must not jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, including degradation of critical habitat (See NPS *Management Policies* (1988) and guidance on threatened and endangered species).

15. **Historic properties:** Action must not have adverse effects on historic properties listed or eligible for listing in the National Register of Historic Places.

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Appendix G. Animal and Plant Special Status Species

Animal Species of Concern – Sequoia National Park

SPECIES	LISTING STATUS		STATUS
Animal species	**California**	**Federal**	**Comment**
California condor *Gymnogyps californianus*	CE	FE	Appear to be extirpated from the project area (Werner, pers. comm. 2009)
Pacific fisher *Martes pennanti*	Species of Concern	FCS	Known to occur in the project area, though they tend to be shy and solitary. Project area is in a developed area with human disturbance and noise levels. Sightings have been rare.
Bald eagle *Haliaeetus leucocephalus*	CE	Delisted	low probability of presence but could fly over
Swainson's hawk *Buteo swainsonii*	CT		No record of occurrence or habitat in project area
Peregrine falcon *Falco peregrinus anatum*	CE (candidate for delisting)	Delisted	Occasionally observed flying canyon, no breeding documented, may fly over project area.
Great gray owl *Strix nebulo*	CE		Not known to occur in the project area, unlikely to occur due to lack of habitat
Willow flycatcher *Empidonax trailli*	CE		Not known to occur in the project area, unlikely to occur due to lack of habitat
Sierra Nevada red fox *Vulpes vulpes*	CT		Not observed in the project area, rarest mammal in the park, Last known populations Lassen Peak
Wolverine Gulo gulo	CT		Project area in historic range, no known occurrence in Cedar Grove area, prefer area with low human disturbance

SPECIES	LISTING STATUS		STATUS
Animal species	**California**	**Federal**	**Comment**
Northern goshawk *Accipiter gentilis*	Species of Concern		Common in high forested areas of the park, no records of occurrence for Cedar Grove area (Werner, pers. comm. 2009)
Short-eared owl *Asio flammeus*	Species of Concern		Not known to occur in the project area, unlikely to occur due to lack of habitat
Long-eared owl *Asio otus*	Species of Concern		Rare species in the park, one record of occurrence west of Cedar Grove by Avalanche Creek from 1990 (Werner, pers. comm. 2009)
California spotted owl *Strix occidentalis occidentalis*	Species of Concern		Occurred in Cedar Grove area historically. 2007 and 2008 owl surveys did not detect any owls in the project area.
Black swift *Cypseloides niger*	Species of Concern		Occurred in project area historically, though there have been no records of occurrence since 1988 (Werner, pers. comm. 2009)
Vaux's swift Chaetura vauxi	Species of Concern		Most of the records from the park come from the area between Ash Mountain and Giant Forest and Grant Grove.
Harlequin duck *Histrionicus histrionicus*	Species of Concern		Known to breed along shores of swift, shallow rivers in Sierra Nevadas. Most recent records of occurrence are from 1937 (Werner, pers. Comm. 2009)
Olive-sided flycatcher *Contopus cooperi*	Species of Concern		Present in the park, but is considered uncommon in the Cedar Grove area (Werner, pers. comm. 2009)

SPECIES	LISTING STATUS		STATUS
Animal species	**California**	**Federal**	**Comment**
Purple martin *Progne subis*	Species of Concern		Only three records of occurrence for the park from 1987-1991 (Werner, pers. comm. 2009)
Yellow warbler *Dendroica petechia brewsteri*	Species of Concern		Common in the project area. Project may create more nesting habitat when river restoration project is completed (Werner, pers. comm. 2009)
Summer tanager *Piranga rubra*	Species of Concern		Not known to occur in the project area, unlikely to occur due to lack of habitat
Northern harrier Circus cyaneus	Species of Concern		Not known to occur in the project area, unlikely to occur due to lack of habitat
Lucy's warbler *Vermivora luciae*	Species of Concern		Not known to occur in the project area, unlikely to occur due to lack of habitat
Black storm-petrel *Oceanodroma melania*	Species of Concern		Not known to occur in the project area, unlikely to occur due to lack of habitat
Pallid Bat *Antrozous pallidus*	Species of Concern		Known to occur in the parks and could potentially occur in the project area. Could use the bridge, crevices and cavities in trees and rocks for hibernation and roosting in the project area.
Townsends big-eared bat *Corynorhinus townsendii*	Species of Concern		Known to occur in the parks and could potentially occur in the project area. Could use the bridge, crevices and cavities in trees and rocks for hibernation and roosting in the project area.

SPECIES	LISTING STATUS		STATUS
Animal species	**California**	**Federal**	**Comment**
American badger *Taxidea taxus*	Species of Concern		Two historic records of occurrence for Cedar Grove area from 1962-1964, very rare (Werner, pers. comm. 2009)
Yosemite toad *Bufo canorus*	Species of Concern		Not known to occur in the project area, unlikely to occur due to lack of habitat
Sierra Madre yellow-legged frog (formerly mountain yellow-legged frog *Rana muscosa*	Species of Concern	FCS	Appear to be extirpated from the project area (Werner, pers. comm. 2009)
Park plant special status species			
Tompkin's sedge *Carex tompkinsii*	Rare		Known to occur in Kings River drainage. No populations detected in project area (Haultain, pers. comm. 2009)
Tehipite Valley jewelflower *Streptanthus fenestratus*			Known to occur in Kings River drainage. No populations detected in project area (Haultain
Hall's daisy *Erigeron aequifolius*			Known to occur in Kings River drainage. No populations detected in project area (Haultain
Marble rockmat *Petrophytum caespitosum* ssp. *Acuminatum*			Known to occur in Kings River drainage. No populations detected in project area (Haultain
Muir's tarplant *Calrquistia muirii*			Known to occur in Kings River drainage. No populations detected in project area (Haultain
Each of the abovementioned park plant special status species are recognized by the California Native Plant Society (CNPS) as being rare or endangered and are thus treated by the NPS as species status species when planning projects. Each is included on the CNPS list 1B, *Plants Rare, Threatened or Endangered in California and Elsewhere*, with a threat code of 3, indicating *Not very endangered in California* (CDFG Natural Diversity Database, Special Vascular Plants, Bryophytes, and Lichens list January 2009)			

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As the nation's principal conservation agency, the Department of the Interior has the 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 historic 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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