

# **Chapter 1. Proposed Project**

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## **1.1. Introduction**

The California Department of Transportation (Caltrans) is planning a project at the Mill Creek Bridge (Bridge No. 08-0133) on State Route 36 (SR 36) in Tehama County near Childs Meadow, approximately 0.24 mile east of the junction of State Route 172 (Exhibits 1 and 2). The proposed project would entail rehabilitation of the bridge deck and placement of rock slope protection (RSP) at the bridge foundations to prevent scour.

The project is included in the 2010 State Highway Operation and Protection Program (SHOPP) and would be constructed in 2011.

## **1.2. Purpose and Need**

The purpose of the project is to protect the bridge foundation from scour and maintain the bridge deck surface.

The Mill Creek Bridge is a two-span reinforced concrete girder structure that was built in 1966. The bridge abutments, including wing walls, and the center pier wall are founded on concrete spread footings. Caltrans bridge maintenance records indicate a history of scour at the bridge foundations. After high flows in 1997, and in 2000, large RSP was placed at the east abutment. Following storms in December of 2005, RSP was placed behind the wing walls of the west abutment. A Caltrans Bridge Inspection Report dated August 19, 2008 indicates that the stream channel had degraded approximately 1.6 feet since the previous channel cross-section measurement taken on May 10, 2006. Currently, the footing of the west abutment and part of the footing of the center pier are exposed. A hydraulic analysis revealed that the structure is scour critical and the potential scour depth is below the elevation of the footings. Severe scour could result in damage that would require emergency repairs or, in the worst case, closure of the bridge for an indefinite period.

The existing bridge deck is reinforced Portland cement concrete (PCC) with an asphalt concrete (AC) surface, which exhibits signs of deterioration due to wear and weathering.

### **1.3. Project Description**

The proposed project, Alternative B, would entail rehabilitation of the bridge deck and placement of RSP at the foundation of the bridge abutments and the center pier wall. The work would be restricted to specific time frames due to the presence of sensitive species. Continuous work activities would be required to begin no later than May 15 due to the willow flycatcher and work within the wetted portion of the stream would be restricted to the period of July 1 through August 31 due to the presence of listed salmonids. These constraints are discussed in detail in Section 2.3 of this document.

### **1.4. Project Alternatives**

Caltrans approved an internal document called a Project Scope Summary Report (PSSR) on October 7, 2005 to formally initiate the project development process. The following alternatives were evaluated in the PSSR:

#### **1.4.1. Alternative A (No Build)**

Alternative A assumes that a project would not be initiated to address the current deck surface and foundation scour conditions. Based on a hydraulic analysis and the existing foundation design, the bridge is susceptible to severe scour, which could result in damage and possible weight restrictions or closure of the highway for an indefinite period of time. In addition, with the No Build alternative, the bridge deck surfacing would continue to wear resulting in a deterioration of ride quality and the need for increased maintenance.

#### **1.4.2. Alternative B (Place RSP at Foundations and Rehabilitate Bridge Deck)**

Alternative B would entail the placement of 2-ton RSP at the bridge abutments and center pier to protect the structure's foundation from scour damage. The bridge deck surfacing and joint seals would be removed and replaced. In addition, the metal beam guardrail at the bridge approaches would be adjusted and upgraded to current design standards as necessary and new traffic striping would be applied.

Equipment capable of excavating and handling large RSP, such as an excavator or backhoe, would require access to the bridge foundations from each side of the creek. Due to the steepness of the streambank on the west side of the bridge and the presence of wetlands and riparian vegetation, an alternate construction access plan was developed. Access points from SR 36 would be constructed on the east side of the creek on the north and south sides of the highway. Temporary stream crossing structures would be installed upstream and downstream of the highway bridge to

provide access to the west side of the creek. An overhead utility line that runs parallel to the south side of the highway would be relocated to provide clearance for construction equipment. It is anticipated that the utility company would elect to relocate the line underground on its current alignment, with the exception of where it would cross Mill Creek. At Mill Creek, the utility line would be attached to the southern edge of the bridge deck. The placement of RSP at the bridge foundations would require a temporary stream diversion to dewater the work area. The work would be accomplished in three stages. Preliminary plan sheets, which include the stream diversion sequence, placement of RSP, a staging area, temporary access roads, and stream crossings are included in Appendix B. The construction sequence for placement of RSP at the bridge foundations would occur as follows:

Stage 1: Prior to the commencement of any construction activities, temporary environmentally sensitive area (ESA) fencing would be installed to protect areas adjacent to the work zone from unnecessary encroachment and inadvertent impacts. Work within the flowing stream would not begin until July 1. Preparatory work, which could occur in upland areas and dry portions of the stream channel, would include construction of the equipment access roads near the northeast and southeast quadrants of the bridge, the southern stream crossing structure, and staging and material storage area near the southeast quadrant of the bridge. Any large woody debris within or near the banks of Mill Creek that would interfere with construction would be temporarily stockpiled on dry land for later use as a mitigation measure. Access roads from the State highway would be created on the north and south sides of the highway. The access roads would be constructed with imported fill and would extend approximately 250 feet to the eastern bank of Mill Creek. If the east side of the stream channel is dry, a stream crossing structure would be constructed immediately south of the highway bridge over the proposed diversion channel. The temporary crossing would consist of a horizontal deck, comprised of two ten-foot spans, utilizing a concrete K-rail section or similar material for a center support. The abutments would be constructed of clean imported cobbles. K-rail would be installed parallel to the creek to contain the cobble abutments. Rock used for scour protection would consist of 2-ton RSP over a course of smaller rock that would act as a filter to prevent fines from being extracted through the larger rock by the current. The rock would be placed at the east abutment and the east side of the center pier wall. A key trench would be excavated to the depth of the top of the footings and the RSP would be placed according to the plan sheets. Starting on July 1, when work is permitted in the flowing stream, any work on the east side of the bridge that could not be completed because it was within the wetted portion of the channel would be completed. Appropriate stream diversion and dewatering practices would be employed.

Stage 2: A second temporary stream crossing structure would be installed approximately 100 feet upstream of the highway bridge to gain access to the west side of the creek for the placement of RSP at the west abutment and the west side of the center pier. The temporary crossing would be similar to the one constructed downstream of the highway bridge. As the temporary crossing was being constructed, the diversion channel would be excavated, beginning at the downstream end and working towards the stream diversion point north of the highway bridge. The diversion channel would extend approximately 150 feet upstream and 150 feet downstream of the highway bridge and would be no deeper than the thalweg (a line connecting the lowest points of successive cross sections through a river channel or valley) of the active channel. A portion of a natural channel exists south of the highway bridge, therefore, little work would be required to prepare the diversion channel from that point to the point where it would re-enter the original channel downstream. The balance of the proposed diversion channel, from the highway bridge to the diversion point upstream would require excavation. The volume of excavation would be roughly 250 yards of cobbly, silty streambed material, which would be disposed of at an appropriate upland disposal site. Concrete K-rail would be placed parallel with the stream channel between the live channel and the diversion channel from the diversion point to a point approximately 50 feet downstream of the south edge of the bridge. A layer of heavy gauge plastic sheeting would be placed against the K-rail and covered with clean cobbles to prevent seepage and scour at the base of the K-rail.

Stage 3: Once the temporary stream crossing structures are in place and the diversion channel is completed, the remaining fill at the north end of the diversion channel would be removed allowing the live stream to enter the diversion channel. Water from two small ditches that flow into the west bank of Mill Creek north of the highway would also need to be diverted around the work area. It is anticipated that the flows would be diverted through small diameter flexible pipes. Once the work area is dewatered, key trenches for the RSP would be excavated at the western bridge abutment and the west side of the center pier where RSP and a course of filter rock would be placed. Following the placement of RSP, the western streambank would be restored as close as possible to pre-construction conditions. Mill Creek and the two ditches would be diverted back into their original channels. The concrete K-rail used to reinforce the temporary diversion channel would be removed from the stream channel and the temporary crossing structure south of the highway bridge would be removed. The upper portion of the temporary diversion channel would be filled in with clean large rock and the temporary stream crossing structure north of the bridge would be dismantled. Cobbles used for the abutments of the temporary crossing structures would be spread throughout the stream channel to fill in any voids created by the original excavations. Large woody debris that had

been temporarily stockpiled would be strategically positioned and anchored in the stream channel as a mitigation measure to improve salmonid stream habitat. The eastern streambank would then be restored as close as possible to pre-construction conditions.

The deck rehabilitation portion of the project would entail removal of the existing AC surfacing and joint seals. AC is typically ground off and used by Caltrans Maintenance crews to supplement existing shoulder backing material along State highways. A new polyester overlay would be applied to the bridge deck. A polyester overlay, due to its superior sealing and wearing characteristics, would provide better protection of the underlying PCC deck. Since the existing AC surface has been built up over the years and is several inches thicker than the new polyester surface would be, it would be necessary to reconstruct full structural sections of roadway that abut the bridge to create a smooth transition. Metal beam guardrail at the bridge approaches would need to be adjusted for height and upgraded as necessary to comply with modern highway design standards. New bridge deck joint seals would be installed and traffic striping would be applied on the deck surface. One-way traffic control would be necessary as work occurs on the bridge deck.

### 1.5. Permits and Approvals

<b>Agency</b>	<b>Permit/Approval</b>	<b>Requirement</b>
California Department of Fish & Game, Region 1	Stream/Lakebed Alteration Agreement [Section 1602 Fish and Game code]	Required for construction activities within the stream/riparian corridor. Permit to be obtained by Caltrans.
California Department of Fish & Game, Region 1	Consistency Determination [Section 2080.1(1) Fish and Game Code]	Required due to potential effects upon listed species.
United States Army Corps of Engineers, Sacramento District	Department of the Army Permit [Section 404 of the Clean Water Act]	Required for construction activities in wetlands and within the ordinary high water elevation of the stream. Permit to be obtained by Caltrans.
Regional Water Quality Control Board, Central Valley Region	Water Quality Certification [Section 401 of the Clean Water Act]	Pre-requisite for Army Corps permit. Water Quality Certification to be obtained by Caltrans.
Regional Water Quality Control Board, Central Valley Region	Dewatering permit [National Pollutant Discharge Elimination System]	A dewatering permit may be necessary for diverting the stream and dewatering the work area. Permit to be obtained by contractor.

<b>Agency</b>	<b>Permit/Approval</b>	<b>Requirement</b>
NOAA Fisheries	Section 7 consultation (Biological Opinion) for threatened and endangered species (steelhead and spring-run salmon)	Required due to work required within salmonid habitat. Coordination conducted by Caltrans.

## **Chapter 2. Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures**

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This chapter explains the impacts that the project would have on the human, physical, and biological environments in the project area. It describes the existing environment that could be affected by the project and potential impacts from each of the alternatives.

As part of the scoping and environmental analysis conducted for the project, the following environmental issues were considered but no adverse impacts were identified: aesthetics, agricultural resources, cultural resources, geology or soils, mineral resources, air quality, noise, land use and planning, population and housing, community resources, public services, recreation, transportation, or emergency services.

The proposed project would have a less than significant impact on water quality, wetlands, floodplain, hazardous waste, traffic, and utilities.

Potential adverse impacts to sensitive species would be reduced to a level of less than significant with the implementation of mitigation measures.

### **2.1. Plant Species**

#### **2.1.1. Regulatory Setting**

The U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Game (CDFG) share regulatory responsibility for the protection of special-status plant species. "Special-status" species are selected for protection because they are rare and/or subject to population and habitat declines. Special status is a general term for species that are afforded varying levels of regulatory protection. The highest level of protection is given to threatened and endangered species; these are species that are formally listed or proposed for listing as endangered or threatened under the Federal Endangered Species Act (FESA) and/or the California Endangered Species Act (CESA). Please see the Threatened and Endangered Species Section 2.3 in this document for detailed information regarding these species.

This section of the document discusses all the other special status plant species, including CDFG fully protected species and species of special concern, USFWS

candidate species, and non-listed California Native Plant Society (CNPS) rare and endangered plants.

The regulatory requirements of FESA can be found at United States Code 16 (USC), Section 1531, et seq. See also 50 CFR Part 402. The regulatory requirements for CESA can be found at Fish and Game Code, Section 2050, et seq. Caltrans' projects are also subject to the Native Plant Protection Act, found at Fish and Game Code, Section 1900-1913, and the California Environmental Quality Act, Public Resources Code, Sections 2100-21177.

### 2.1.2. Affected Environment

Plant communities present in the project area include montane (growing or living in mountainous regions) riparian scrub, montane black cottonwood riparian forest, wet montane meadow, and dry montane meadow.

Montane riparian scrub, dominated by white alder (*Alnus rhombifolia*), is found along the east side of Mill Creek on an exposed gravel bar. Other common species in the riparian forest include black cottonwood (*Populus balsamifera* ssp. *trichocarpa*), shining willow (*Salix lasiandra* var. *lasiandra*), and arroyo willow (*Salix lasiolepis*). Lodge pole pine (*Pinus contorta*) saplings are also present within the riparian vegetation downstream of the bridge. The herbaceous understory is made up of both wetland and upland plants. Wetland plants, such as rusty sedge (*Carex subfusca*), Rocky Mountain rush (*Juncus saximontanus*), and Nevada rush (*Juncus nevadensis*), are present in wetter areas downstream of the bridge. In drier areas upstream of the bridge, upland plants such as Spanish lotus (*Lotus purshianus* var. *purshianus*) and naked eriogonum (*Eriogonum nudum*) colonize as well as plants found in somewhat wetter conditions such as sheep sorrel (*Rumex acetosella*) and English plantain (*Plantago lanceolata*).

Also included as riparian scrub is a ditch on the northwest side of the bridge. This ditch drains the adjacent meadow and has running water all year. White alder and shining willow line the ditch with a dense understory of small-fruit bulrush (*Scirpus microcarpus*) and woolly sedge (*Carex lanuginosa*). The water flows into Mill Creek at the base of the west abutment wing wall.

Adjacent to the ditch is a small area of disturbed dry montane meadow. This area is inhabited by both wetland and upland herbaceous plants. Nebraska sedge (*Carex nebrascensis*) and Baltic rush (*Juncus balticus*) are present, but upland plants including Kentucky bluegrass (*Poa pratensis* ssp. *pratensis*), yarrow (*Achillea millefolium*), slender phlox (*Phlox gracilis*), and California rayless fleabane (*Erigeron inornatus* var. *inornatus*) are also dominants. This area may have been wetter in the

past but has been dewatered, possibly for decades, by a ditch constructed uphill by the landowner. Water from the adjacent meadow is collected in the ditch and runs into Mill Creek approximately 80 feet upstream of the bridge.

The northeast quadrant of the bridge is a terrace above the creek and is part of the historic shared floodplain of Mill Creek's split channel. The vegetation in this area is montane black cottonwood riparian forest with a sparse herbaceous understory. Although black cottonwood is found in wetter areas, the understory is made up of upland species including Nevada bird foot's trefoil (*Lotus nevadensis* var. *nevadensis*), Spanish lotus, naked eriogonum, and intermediate wheatgrass (*Elytrigia intermedia* ssp. *intermedia*). Incense cedar (*Calocedrus decurrens*) saplings, another upland plant, are also colonizing the area.

The proposed staging area on the east side of the bridge south of the roadway is dominated by upland vegetation. This area was used as a detour in 1966 when the bridge was constructed to replace a culvert. This area supports a ruderal community consisting of native and non-native herbaceous species. Native species such as gayophytum (*Gayophytum diffusum* ssp. *diffusum*), Harkness's linanthus (*Linanthus harknessii*), and slender tarweed (*Madia gracilis*), occur with non-natives such as cheat grass (*Bromus tectorum*) and bulbous bluegrass (*Poa bulbosa*). Mountain whitehorn (*Ceanothus cordulatus*) is present but is a minor component of the community.

Wet montane meadow occurs in two locations within the project limits, a ditch constructed by the adjacent landowner near the northwest project limits and a roadside ditch near the southwest project limits. The landowner constructed ditch has flowing water all year. Vegetation consists of a narrow strip of wetland plants along the banks of the ditch, primarily small-fruit bulrush. The roadside ditch near the southwest project limits has an intermittent water flow and is dominated by Baltic rush.

No federal or state listed plant species are known to occur within the project limits.

### **2.1.3. Environmental Consequences**

Alternative A would entail no immediate action to correct the bridge deficiencies and therefore would not affect plant communities.

Alternative B would entail placement of RSP at the bridge foundations and rehabilitation of the bridge deck. Construction of temporary access roads and a construction staging area would temporarily impact a total of approximately 0.38 acre of montane black cottonwood riparian forest consisting of approximately 37 trees

ranging in size from 3 inches in diameter at breast height (DBH) to approximately 14 inches DBH.

#### **2.1.4. Avoidance, Minimization, and/or Mitigation Measures**

1. Vegetation removal would be limited to the minimum extent necessary to construct the project.
2. Riparian vegetation would be cut at the base, leaving the root system intact.
3. Temporary ESA fencing would be erected to protect vegetated areas adjacent to the work zone from unnecessary encroachment and inadvertent impacts during construction.
4. Following construction, white alder and willow saplings would be planted in disturbed areas within the riparian zone, with the exception of active gravel bars within the channel of Mill Creek. Because the riparian areas are located on private property, which is a cattle ranch, no monitoring or maintenance of riparian plantings is proposed.

## **2.2. Animal Species**

### **2.2.1. Regulatory Setting**

Many state and federal laws regulate impacts to wildlife. The USFWS, National Oceanic and Atmospheric Administration (NOAA) Fisheries, and the CDFG are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with wildlife not listed or proposed for listing under the state or federal Endangered Species Act. Species listed or proposed for listing as threatened or endangered are discussed in Section 2.3. All other special-status animal species are discussed here, including CDFG fully protected species and species of special concern, and USFWS or NOAA Fisheries candidate species.

Federal laws and regulations pertaining to wildlife include the following:

- National Environmental Policy Act
- Migratory Bird Treaty Act
- Fish and Wildlife Coordination Act

State laws and regulations pertaining to wildlife included the following:

- California Environmental Quality Act
- Sections 1600-1603 of the Fish and Game Code
- Sections 3503-3513 of the Fish and Game Code

### **2.2.2. Affected Environment**

Only two mammal species were observed during site visits, mule deer (*Odocoileus hemionus*) and yellow-bellied marmot (*Marmota flaviventris*). Thirty species of birds were identified. Most common were cliff swallows (*Petrochelidon pyrrhonota*), dark-eyed junco (*Junco hyemalis*), orange-crowned warbler (*Vermivora celata*), and western wood peewee (*Contopus sordidulus*). Cliff swallows were noted nesting on the Mill Creek Bridge. The yellow warbler (*Dendrocia petechia*) is a CDFG species of special concern. The species was once a common breeder in riparian areas throughout most of California, except the deserts. Yellow warblers are generally found in riparian vegetation along streams and wet meadows. They breed mainly in wet, deciduous thickets and especially those dominated by willows. Nesting and foraging habitat is present within the project area. Although focused surveys were not conducted for the yellow warbler, it was observed during surveys for willow flycatcher (*Empidonax traillii*), which is discussed in Section 2.3.

Central Valley fall-run Chinook salmon (*O. tshawytscha*) are present in Mill Creek for spawning and rearing. Fall-run salmon migrate from June through December, peaking in September and October. Spawning occurs from late September through December, peaking in late October. Emergence occurs between December and June. The fry and sub-yearlings emigrate after four to seven months in freshwater for fall-run and seven to 13 months for late fall-run. Central Valley spring-run Chinook salmon (*O. tshawytscha*) and California Central Valley steelhead (*O. mykiss*) are discussed in Section 2.3. Other species expected to occur in the project area include resident rainbow trout (*O. mykiss*), speckled dace (*Rhinichthys osculus*), and riffle sculpin (*Cottus gulosus*).

### **2.2.3. Environmental Consequences**

Alternative A would entail no immediate action to correct the bridge deficiencies and therefore would not affect animals.

Alternative B would involve the placement of RSP at the bridge foundations and rehabilitation of the bridge deck. This alternative would require the removal of trees and other vegetation, earthwork adjacent to Mill Creek, and excavations and grading within the channel of Mill Creek. The removal of trees could affect nesting birds.

Ground disturbing activities adjacent to Mill Creek and within the channel of Mill Creek would result in temporary increases in turbidity and suspended solids. Indirect impacts include intermittent increases in turbidity and suspended solids due to seasonal increases in stream flow rates following construction activities within the stream channel.

#### **2.2.4. Avoidance, Minimization, and/or Mitigation Measures**

1. Active bird nests attached to the bridge would not be disturbed.
2. All vegetation that could support nesting birds requiring removal would be removed prior to March 1. If it were necessary to remove additional trees during the nesting period, a qualified biologist would survey the tree(s) to verify that it was uninhabited prior to removal.
3. Only clean materials would be placed in the stream channel.
4. The contractor would be required to prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) and a Temporary Clear Water Diversion Plan. These plans would address water quality and would be subject to approval by the Caltrans Resident Engineer.

### **2.3. Threatened and Endangered Species**

#### **2.3.1. Regulatory Setting**

The primary federal law protecting threatened and endangered species is the FESA: 16 USC, Section 1531, et seq. See also 50 CFR Part 402. This act and subsequent amendments provide for the conservation of endangered and threatened species and the ecosystems upon which they depend. Under Section 7 of this act, federal agencies, such as the Federal Highway Administration, are required to consult with the USFWS and the NOAA Fisheries to ensure that they are not undertaking, funding, permitting or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Critical habitat is defined as geographic locations critical to the existence of a threatened or endangered species. The outcome of consultation under Section 7 is a Biological Opinion or an incidental take permit. Section 3 of FESA defines take as “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or any attempt at such conduct.”

California has enacted a similar law at the state level, the CESA, California Fish and Game Code, Section 2050, et seq. CESA emphasizes early consultation to avoid

potential impacts to endangered and threatened species and to develop appropriate planning to offset project caused losses of listed species populations and their essential habitats. The CDFG is the agency responsible for implementing CESA. Section 2080 of the Fish and Game Code prohibits "take" of any species determined to be an endangered species or a threatened species. Take is defined in Section 86 of the Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." CESA allows for take incidental to otherwise lawful development projects; for these actions an incidental take permit is issued by CDFG. For projects requiring a Biological Opinion under Section 7 of the FESA, CDFG may also authorize the take of state listed species by issuing a Consistency Determination under Section 2080.1 of the Fish and Game Code.

### **2.3.2. Affected Environment**

Three listed species have been identified within the project limits: Central Valley spring-run Chinook salmon (*O. tshawytscha*), state and federally listed as threatened, California Central Valley steelhead [steelhead] (*O. mykiss*), +federally listed as threatened, and the willow flycatcher (*Empidonax traillii*), a migratory bird state listed as endangered. In addition, the Mill Creek Bridge project falls within federally designated critical habitat for salmon and steelhead and is Essential Fish Habitat (EFH) for salmon. The three attributes of critical habitat present in Mill Creek include rearing, spawning, and migration corridors. EFH pertains to salmon, such as the spring-run Chinook, which are harvested commercially in the ocean. EFH is defined by the Magnuson-Steven Fishery Conservation and Management Act as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. Mill Creek provides three of the components of freshwater EFH for salmon: 1) habitat for juvenile rearing, 2) a corridor for juvenile and adult migration, and 3) spawning sites.

#### **2.3.2.1. Salmonids**

A Biological Assessment (BA) and Essential Fish Habitat Assessment (EFHA) was prepared in accordance with Section 7 of the FESA to address potential effects to listed salmonids, critical habitat, and EFH. Upon receipt of a Biological Opinion from NOAA Fisheries, Caltrans will seek a Consistency Determination from CDFG. Based on the BA, the project may affect (likely to adversely affect) salmonids, may affect (not likely to adversely affect) critical habitat, and would have no adverse effect upon EFH.

Salmonids are present in this reach of Mill Creek throughout the year in different life stages. Adult fish can be found from approximately September through June. Suitable spawning habitat is present in the vicinity of the bridge. Juveniles will

remain in the vicinity for a period of approximately two years before traveling downstream.

The project area falls within federally designated critical habitat for two listed species, spring-run Chinook and steelhead. Critical habitat includes the stream channel up to the ordinary high water mark. The upstream limit of critical habitat for spring-run extends approximately 2.5 miles above the bridge. Steelhead critical habitat extends approximately one mile above the bridge.

EFH is defined in the Magnuson-Stevens Act as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” This includes aquatic areas above manmade barriers except impassable barriers such as dams. Freshwater EFH for the Pacific salmon fishery includes waters accessible to salmon as well as most habitat that was historically accessible to salmon. Mill Creek is designated EFH for Pacific salmon.

#### **2.3.2.2. Willow Flycatcher**

The willow flycatcher breeds in mountain meadows and riparian areas at elevations between 2,000-8,000 feet during the period of approximately June 1 through August 31. Protocol level surveys were performed in 2008 and 2009. Willow flycatchers were identified near the project limits both years. Foraging habitat is present within the project limits and a nesting territory is presumed adjacent to the project.

### **2.3.3. Environmental Consequences**

#### **2.3.3.1. Salmonids**

Alternative A would entail no immediate action to correct the bridge deficiencies and therefore would not affect salmonids.

Implementation of Alternative B would require vegetation removal and disturbance within the floodplain of Mill Creek and within the live stream channel as described in Section 1.4.2. Construction activities within the creek, e.g., stream diversion, dewatering, and placement of fill for construction of temporary stream crossing structures may result in the direct take of listed salmonids. In addition, activities within the flowing stream and wetted portions of the channel could result in intermittent increases in turbidity and suspended solids. Increased levels of turbidity may disrupt salmonid migration, feeding, and rearing. Sedimentation has the potential to reduce habitat quality and affect the invertebrate populations, thus affecting the food supply.

Indirect impacts would include intermittent increases in turbidity and suspended solids. The removal of vegetation and soil disturbance could lead to erosion and increase the potential for sediment transport into surface waters which could affect salmonids at a later time. In addition, disturbance within the streambed would be expected to result in a temporary increase in turbidity during the first high flows of the year following construction.

The operation of construction equipment and machinery in the vicinity of Mill Creek would have the potential to result in an accidental spill of petroleum products, which are extremely toxic to fish.

#### **2.3.3.2. Willow Flycatcher**

Alternative A would entail no immediate action to correct the bridge deficiencies and therefore would not affect the willow flycatcher.

Alternative B would entail placement of RSP at the bridge foundations and rehabilitation of the bridge deck. The work zone would be within 300 linear feet of potential willow flycatcher nesting and foraging habitat. Construction noise may interfere with communication between birds and the establishment of nesting territories adjacent to the project site. The project is scheduled to be awarded in May 2011 and it is anticipated that the contractor would begin work by May 15. The project is expected to take approximately 66 days to complete. The work would require equipment such as excavators, loaders, dump trucks, compressors, pavement grinders, paving machines, pavement rollers, and smaller miscellaneous equipment such as generators. This type of equipment typically generates noise levels up to approximately 90 dBA at the source. Noise levels in excess of 70 dBA are anticipated within potential willow flycatcher habitat adjacent to the project.

### **2.3.4. Avoidance, Minimization, and/or Mitigation Measures**

#### **2.3.4.1. Salmonids**

The BA proposes the following conservation measures to avoid, minimize, and mitigate impacts to salmon and steelhead, critical habitat, and EFH:

1. All in-stream work would be restricted to the period of July 1 through August 31 when adult listed salmonids are least likely to be present in Mill Creek. If a portion of the channel is dry prior to July 1, work could begin in that area. The work area would be restricted to the minimum necessary to construct the project.

2. Equipment would not be permitted to work in the flowing stream except for the following necessary items: installation and removal of concrete K-rail barrier and the movement of rock necessary to divert the live stream channel between the original channel and the diversion channel. All other work would occur in the dry stream channel. Temporary stream crossing structures would be constructed to minimize impacts to the creek channel. Abutments for the crossings would be constructed of clean, uncrushed, rounded natural river rock and concrete K-rail. A diversion channel would be constructed beneath the east span of the highway bridge to dewater the work area beneath the west span.
3. Fish passage would be maintained at all times per Section 5901 of the California Fish and Game Code. Although it is not anticipated that adult spring-run Chinook would be present during the July 1 to August 31 in-stream work window, the temporary stream diversion would be constructed to allow passage of adult spring-run.
4. Construction disturbance within Mill Creek would be minimized so that fish migration or spawning would not be adversely affected. If salmon are likely to be present, fish clearing or salvage operations would be conducted by qualified personnel prior to construction. Stranded fish would be captured and returned to a suitable location in the live stream. Caltrans Environmental Staff would notify NOAA Fisheries and CDFG of fish recovery details including date, time, location, and any other information specified in the plan.
5. Caltrans requires the contractor to prepare and implement a SWPPP. During construction, turbidity levels would not be allowed to increase above the normal basin condition standards set by the Central Valley Regional Water Quality Control Board (CVRWQCB). Activities would not be allowed to exceed the following turbidity criteria as stated in the basin plan (CRWQCB 2007):
  - Where natural turbidity is between 0 and 5 Nephelometric Turbidity Units (NTUs), increases shall not exceed 1 NTU;
  - Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent;
  - Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 percent;

- Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.

Monitoring would be conducted in compliance with Section 401 of the Clean Water Act through issuance of a Water Quality Certification from the CVRWQCB. Should the standard be exceeded, project operations contributing to excessive turbidity would cease until the standard could again be met.

Best management practices (BMPs) would be used on all disturbed streambanks and access areas upon completion of construction to reduce the production of excess sediment. BMPs are selected for each individual project during the preparation of the SWPPP and depend upon the specific circumstances and conditions in the project area. The BMPs are described in detail in the Caltrans Storm Water Quality Handbook: Construction Contractor's Guide and Specifications (Caltrans 2003). Typical BMPs for reducing sedimentation and stabilizing soils are:

- Temporary seeding and planting;
- Installation of silt fencing;
- Application of mulch;
- And installation of fiber rolls.

The contractor shall use only certified weed-free erosion control materials to prevent the spread of non-native, weedy species.

6. Equipment and vehicles shall be refueled at least 150 feet away from Mill Creek. A Caltrans Biologist shall approve any refueling if required within 150 feet of the stream channel. Hydraulic equipped machinery operating in the stream zone would be required to utilize vegetable oil or other suitable fluids in the hydraulic system.

A Spill Prevention Plan would be included in the SWPPP. The plan would outline the actions to be taken in the event of a leak or spill of petroleum products, hydraulic fluid, or other deleterious substance within the creek channel. The plan for emergency clean-up of any spills will be available on-site and materials for spill cleanup will be maintained on-site. Construction vehicles and equipment would be maintained to prevent contamination of soil or water from leaking hydraulic fluid, fuel, oil, and grease. Staging, storage,

servicing, and re-fueling of vehicles and equipment shall take place outside of the stream channel in a designated construction staging area.

In the event of any leak or spill within the channel, the CDFG, CVRWQCB, and NOAA Fisheries would be notified immediately and all project activities that may affect listed salmonids or habitat would cease. Project activities would be allowed to resume after these agencies had reasonable assurances that no additional impacts would occur.

7. Removal of existing vegetation would not exceed the minimum necessary to complete the work. Riparian vegetation would be trimmed at the base, leaving root systems intact.
8. Approximately 0.51 acre of riparian vegetation would be removed as a result of the project. Disturbed riparian areas that do not require RSP for erosion control would be planted with riparian species including white alder and willow. Riparian vegetation would be replaced at a 1:1 ratio on-site where possible. Gravel bars would not be replanted due to the mobility of the channel. Because the riparian areas are on private property, which is a cattle ranch, the plantings would not be maintained or monitored for success.
9. The contractor would be required to follow the terms and conditions of the regulatory permits to be obtained from the California Department of Fish and Game, CVRWQCB, and the U.S. Army Corps of Engineers.
10. A Caltrans biologist would monitor construction periodically to ensure compliance with all of the requirements included in the BA/EFHA.
11. Large woody debris (LWD) located within the project limits would be temporarily moved from the work area. Following the installation of RSP at the bridge foundations, the LWD would be strategically positioned and anchored in the stream channel to improve salmonid stream habitat. Cabled and bonded boulder clusters may also be placed within the stream channel to improve habitat for juvenile salmonids. LWD and boulder structures would be designed and constructed in accordance with CDFG's Salmonid Stream Habitat Restoration Manual.
12. All areas not required for construction would be designated on the project plan sheets as an ESA. The contractor would be required to install temporary fencing on the boundary of the ESA as the first order of work.
13. To mitigate the effects of temporary sediment increases on listed salmonids, Caltrans would enter into an agreement with the Department of Agriculture,

Lassen National Forest, to improve approximately 3.5 miles of Forest Service dirt roads in the Mill Creek watershed to reduce the potential transport of sediment to surface waters.

#### **2.3.4.2. Willow Flycatcher**

1. In order to discourage the establishment of nesting territories immediately adjacent to the project site, mylar ribbons, specifically designed to deter birds, would be installed prior to May 15 on willows that border the southeast quadrant of the work area.
2. Beginning May 15 and through August 31, the contractor would also be required to establish a continuous construction presence in the southeast quadrant of the project site. With construction activity and noise underway before the arrival of willow flycatchers, the birds would be able to decide whether to nest adjacent to the project or to nest at a greater distance from the site. A continuous construction presence is described as any construction activity or personnel presence resulting in elevated noise levels in the range of approximately 70 to 90 dBA no fewer than five days each week for a least eight daylight hours each day.

## **2.4. Wetlands and Other Waters**

### **2.4.1. Regulatory Setting**

Wetlands and other waters are protected under a number of laws and regulations. At the federal level, the Clean Water Act (33 U.S.C. 1344) is the primary law regulating wetlands and waters. The Clean Water Act regulates the discharge of dredged or fill material into waters of the United States, including wetlands. Waters of the United States include navigable waters, interstate waters, territorial seas and other waters that may be used in interstate or foreign commerce. To classify wetlands for the purposes of the Clean Water Act, a three-parameter approach is used that includes the presence of hydrophytic (water-loving) vegetation, wetland hydrology, and hydric soils (soils subject to saturation/inundation). All three parameters must be present, under normal circumstances, for an area to be designated as a jurisdictional wetland under the Clean Water Act.

Section 404 of the Clean Water Act establishes a regulatory program that provides that no discharge of dredged or fill material can be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded. The Section 404 permit program is run by

the U.S. Army Corps of Engineers (USACE) with oversight by the U.S. Environmental Protection Agency (EPA).

The Executive Order for the Protection of Wetlands (E.O. 11990) also regulates the activities of federal agencies with regard to wetlands. Essentially, this executive order states that a federal agency, such as the Federal Highway Administration, cannot undertake or provide assistance for new construction located in wetlands unless the head of the agency finds: 1) that there is no practicable alternative to the construction and 2) the proposed project includes all practicable measures to minimize harm.

At the state level, wetlands and waters are regulated primarily by the CDFG and the California Regional Water Quality Control Boards (CRWQCB). In certain circumstances, the Coastal Commission (or Bay Conservation and Development Commission) may also be involved. Sections 1600-1607 of the Fish and Game Code require any agency that proposes a project that will substantially divert or obstruct the natural flow of or substantially change the bed or bank of a river, stream, or lake to notify CDFG before beginning construction. If CDFG determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement will be required. CDFG jurisdictional limits are usually defined by the tops of the stream or lake banks, or the outer edge of riparian vegetation, whichever is wider. Wetlands under jurisdiction of the USACE may or may not be included in the area covered by a Streambed Alteration Agreement obtained from the CDFG.

The CRWQCB's were established under the Porter-Cologne Water Quality Control Act to oversee water quality. The CRWQCB also issues water quality certifications in compliance with Section 401 of the Clean Water Act. Please see the Water Quality section [Section 2.7] for additional details.

#### **2.4.2. Affected Environment**

Wetlands and other waters were delineated in accordance with the 2008 *Interim Regional Supplemental to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region*. A total of 0.98 acre of waters of the U.S., including wetlands, is present within the project Environmental Study Limits (ESL), which is depicted in Exhibit 3. Wetlands consist of 0.35 acre of montane riparian scrub and 0.01 acre of palustrine emergent wetland.

Montane riparian scrub wetland is present on the east side of Mill Creek throughout the project limits and in a ditch adjacent to the north side of the highway on the west side of the bridge. Dominant vegetation includes white alder and shining willow. The

primary functions of these wetlands include flood flow alteration, groundwater recharge, fish and wildlife habitat, and endangered species habitat.

Palustrine emergent wetland occurs at two locations within the project limits, a ditch constructed by the adjacent landowner near the northwest project limits and a roadside ditch near the southwest project limits. The landowner constructed ditch has flowing water all year. The vegetation (wet montane meadow) consists of a narrow strip of wetland plants along the banks of the ditch, primarily small-fruit bulrush. The roadside ditch near the southwest project limits has an intermittent water flow and is dominated by Baltic rush. The primary functions of these wetlands include flood flow alteration, sediment stabilization, and wildlife habitat.

Other waters present within the project limits include 0.62 acre of open water consisting of the stream channel of Mill Creek below the ordinary high water mark. The CVRWQCB's Basin Plan lists the following beneficial uses for Mill Creek: domestic water supply, irrigation and stock watering, contact and noncontact recreation, warm and cold water freshwater habitat, migration of cold water species, warm and cold water spawning, and wildlife habitat.

### **2.4.3. Environmental Consequences**

Alternative A would entail no immediate action and therefore, impacts to wetlands and other waters would be avoided.

As described in Section 1.4.2, Alternative B would require heavy equipment access beneath the bridge on both the east and west banks of Mill Creek for the placement of RSP at the abutment and pier foundations. RSP would be keyed into the substrate to ensure stability of the RSP barrier. Access would occur from the east side of the stream channel. It would be necessary to divert the live stream channel and dewater the work area. Grading and excavations would result in temporary increases in turbidity and suspended solids in Mill Creek each time the live stream is diverted and initially during the first high flows of the year.

Estimated impacts to waters are summarized in Table 1. Approximately 0.01 acre of other waters (stream below ordinary high water) would be permanently affected by the placement of RSP at the bridge foundations. Temporary impacts resulting from the temporary stream diversion would consist of 0.15 acre of wetland and 0.01 acre of other waters. Temporary impacts to riparian scrub would be confined to an active gravel bar and therefore would not be replanted following construction.

**Table 1 Summary of Impacts to Wetlands and Other Waters**

<b>Type</b>	<b>Area within the project ESL (Acre)</b>	<b>Temporary Impact (Acre)</b>	<b>Permanent Impact (Acre)</b>
<b>Wetlands</b>	0.36	0.15	0.0
<b>Other Waters</b>	0.62	0.01	0.01
<b>Totals</b>	0.98	0.16	0.01

**2.4.4. Avoidance, Minimization, and/or Mitigation Measures**

1. Typically, construction equipment would access the bridge foundations from each quadrant of the bridge to perform the work efficiently. The stream would be diverted to the side of the channel opposite of where work would occur and the work area would be dewatered. However, due to the presence of wetlands and riparian vegetation on the west side of the bridge and the steepness at the southwest quadrant of the bridge, an alternate construction access route and staging plan has been developed. Access to the west side of the stream channel would occur from the east side of the stream channel via temporary stream crossing structures. This would avoid and minimize impacts to wetlands on the west side of the bridge.
  
2. Sensitive areas such as wetlands and riparian vegetation adjacent to the work zone would be designated as ESAs on the project plan sheets. ESA fencing would be erected as a first order of work to delineate the ESAs. The contractor would be prohibited from entering ESAs.
  
3. Although ESA fencing would be erected during the bridge repair project to prevent access by the contractor to the palustrine wetland near the southwest quadrant of the highway bridge, the utility relocation contractor would need access to this area prior to the start of the bridge repair project. To protect the wetland during the utility relocation, the utility contractor would be required to place an appropriate protective covering, such as a mat, over the wetland prior to accessing the area with vehicles or equipment.

4. The man-made ditch near the northwest quadrant of the highway bridge, which is a palustrine wetland, may need to be crossed with equipment by the bridge repair contractor. A rigid crossing structure, such as a steel plate or wooden timbers, would be required to avoid impacts to the ditch.
5. It is proposed to offset the loss of approximately 0.01 acre of other waters (Mill Creek below the ordinary high water mark) with the mitigation measure proposed in Section 2.3.4.1 (13) of this document, i.e., contribute funds to Lassen Forest to implement a project to reduce sediment transport from a 3.5 mile segment of Forest Service dirt roads within the Mill Creek watershed.

## **2.5. Invasive Plant Species**

### **2.5.1. Regulatory Setting**

On February 3, 1999, President Clinton signed Executive Order 13112 requiring federal agencies to combat the introduction or spread of invasive species in the United States. The order defines invasive species as “any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health.” Federal Highway Administration guidance issued August 10, 1999 directs the use of the state’s noxious weed list to define the invasive plants that must be considered as part of the NEPA analysis for a proposed project.

### **2.5.2. Affected Environment**

Species identified during biological field surveys were compared to the California Department of Food and Agriculture’s list of noxious weed species. The listed noxious species found within the project limits were hoary cress (*Cardaria draba*), bindweed (*Convolvulus arvensis*), and Klamath weed (*Hypericum perforatum*). Hoary cress has a “B” rating; weeds that are subject to eradication, containment, control or other holding action at the discretion of the individual county agricultural commissioner. The other two weeds have a “C” rating; weeds subject to state enforcement action only when found in a nursery, action to retard spread outside of nurseries is at the discretion of the commissioner.

### **2.5.3. Environmental Consequences**

Alternative A would entail no immediate action to correct the bridge deficiencies and therefore would not affect invasive species.

Alternative B would entail placement of RSP at the bridge foundations and rehabilitation of the bridge deck. The proposed project involves relatively minor ground disturbance in sparsely vegetated, cobbly soils. Plant parts, including seeds, could be spread by equipment or through the transport of excavated materials to other locations.

### **2.5.4. Avoidance, Minimization, and/or Mitigation Measures**

Prior to the beginning of construction, noxious weeds would be removed from the site to minimize the potential for spreading the weed. Potential to spread noxious weed seeds is considered low.

## **2.6. Hydrology and Floodplain**

### **2.6.1. Regulatory Setting**

Executive Order 11988 (Floodplain Management) directs all federal agencies to refrain from conducting, supporting, or allowing actions in floodplains unless it is the only practicable alternative. The Federal Highway Administration requirements for compliance are outlined in 23 CFR 650 Subpart A.

In order to comply, the following must be analyzed:

- The practicability of alternatives to any longitudinal encroachments
- Risks of the action
- Impacts on natural and beneficial floodplain values
- Support of incompatible floodplain development
- Measures to minimize floodplain impacts and to preserve/restore any beneficial floodplain values impacted by the project.

The base floodplain is defined as “the area subject to flooding by the flood or tide having a one percent chance of being exceeded in any given year.” An encroachment is defined as “an action within the limits of the base floodplain.”

### **2.6.2. Affected Environment**

Mill Creek is a perennial stream that crosses SR 36 in rural Tehama County at an elevation of 4,800 feet above sea level. The watershed upstream of the bridge is 20 square miles. Mill Creek begins at an elevation of 5,600 feet at the confluence of Sulphur Creek and East Sulphur Creek in Lassen National Forest. Approximately one mile upstream of SR 36, Mill Creek splits into two channels approximately 300 feet apart. The area between the two channels is shared floodplain. Mill Creek crosses SR 36 under Bridge No. 08-0133, which is the west channel (proposed project), and Bridge 08-0060, the east channel. Both channels are active, but the west channel currently conveys the majority of the flow. Prior to a major storm event in January 1997, which resulted in severe flooding in the region, the east channel was the main channel. Downstream of SR 36 the channels merge into a single stream.

Beneficial floodplain values in the project area include flood moderation, sediment accumulation, and ground water recharge. In addition, the floodplain of Mill Creek provides habitat for listed sensitive species including Central Valley spring-run Chinook salmon, California Central Valley steelhead, and the willow flycatcher. These species are discussed in Section 2.3.

### **2.6.3. Environmental Consequences**

Alternative A (No Build) would entail no immediate action and therefore would not have an effect upon Mill Creek nor the floodplain.

As described in Section 1.4.2 of this document, implementation of Alternative B would require temporary encroachment and disturbance within the floodplain to provide access for construction equipment. This would include vegetation removal, construction of temporary stream crossing structures, diversion of the stream flow, and dewatering the work area. Alternative B would not result in substantial modifications or placement of permanent structures within the base floodplain. A Hydraulic Study indicates that the proposed work would not affect the elevation of the floodplain or result in adverse effects upon beneficial floodplain values.

### **2.6.4. Avoidance, Minimization, and/or Mitigation Measures**

1. Encroachment within the floodplain would be minimized to the extent necessary to complete the work. Areas for access roads and a staging area within the floodplain have been designated on plan sheets for the contractor. Construction activities would be confined to these areas to minimize unnecessary disturbance within the floodplain.

2. The removal of vegetation within the floodplain would be minimized to the extent necessary to complete the work.
3. Following construction, all temporary fills and materials, with the exception of clean cobbles used to construct the temporary bridge abutments, would be removed from the site. The cobbles would be spread uniformly throughout the channel to fill in voids. All disturbed areas would be returned as close as possible to pre-construction conditions.

## **2.7. Water Quality and Storm Water Runoff**

### **2.7.1. Regulatory Setting**

Section 401 of the Clean Water Act requires water quality certification from the State Water Resources Control Board (SWRCB) or a Regional Water Quality Control Board (RWQCB) when the project requires a Federal Permit. Typically this means a Clean Water Act Section 404 permit to discharge dredge or fill into water of the United States, or a permit from the Coast Guard to construct a bridge or causeway over a navigable water of the United States under the Rivers and Harbors Act.

Along with Clean Water Act Section 401, Section 402 establishes the National Pollutant Discharge Elimination System (NPDES) for the discharge of any pollutant into waters of the United States. The federal Environmental Protection Agency has delegated administration of the NPDES program to the SWRCB and nine RWQCBs. To ensure compliance with Section 402, the SWRCB has developed and issued Caltrans an NPDES Statewide Storm Water Permit to regulate storm water and non-storm water discharges from Caltrans' right-of-way, properties, and facilities. This same permit also allows storm water and non-storm water discharges into waters of the State pursuant to the Porter-Cologne Water Quality Act.

Storm water discharges from Caltrans' construction activities disturbing one acre or more of soil are permitted under Caltrans' Statewide Storm Water NPDES permit. These discharges must also comply with the substantive provision of the SWRCB's Statewide General Construction Permit. Non-Caltrans construction projects (encroachments) are permitted and regulated by the SWRCB's Statewide General Construction Permit. All construction projects exceeding one acre or more of disturbed soil require a SWPPP to be prepared and implemented during construction. The SWPPP, which identifies construction activities that may cause discharges of pollutants or waste into waters of the United States or waters of the

State, as well as measures to control these pollutants, is prepared by the construction contractor and is subject to Caltrans' review and approval.

Finally, the SWRCB and the RWQCBs have jurisdiction to enforce the Porter-Cologne Act to protect groundwater quality. Groundwater is not regulated by Federal law, but is regulated under the state's Porter-Cologne Act. Some projects may involve placement or replacement of on-site treatment systems (OWTS) such as leach fields or septic systems or propose implementation of infiltration or detention treatment systems which may pose a threat to groundwater quality.

### **2.7.2. Affected Environment**

The project lies within the Upper Mill Creek Hydrologic Sub-Area, Barkley Mountain Hydrologic Area, and Eastern Tehama Hydrologic Unit. The CRWQCB's Basin Plan lists the following beneficial uses for Mill Creek: domestic water supply, irrigation and stock watering, contact and non-contact recreation, warm and cold water freshwater habitat, migration of cold water species, warm and cold water spawning, and wildlife habitat.

### **2.7.3. Environmental Consequences**

Alternative A would not change current conditions at the bridge site and therefore would not result in a change relative to water quality and storm water runoff.

Implementation of Alternative B would require excavations and grading within the channel of Mill Creek and the areas between the streambank and the highway. The work would be confined within an area of approximately four acres. Ground disturbing activities would include cuts and fills to construct temporary access ramps and roads from the highway to the creek channel, minor grading for a construction staging and storage area adjacent to the creek and highway, and excavations within the channel of Mill Creek for stream diversions and dewatering of the work area at the bridge foundations. Most of the excavation and grading within the creek channel would occur in dry portions of the channel. Work would occur within a section of stream approximately 200 feet in length. Stream diversion and dewatering operations would require minor disturbance within the wetted stream channel, for example, shifting the flowing stream to a temporary diversion channel and back or pumping water from an isolated work location where excavations would be required to key-in RSP. Following are potential impacts that could occur as a result of implementation of Alternative B:

### Direct Impacts

- During stream diversions and dewatering operations, fill would be placed temporarily within jurisdictional waters (riparian scrub wetland and Mill Creek).
- Accidental spills or leaks of fluids and fuels from construction equipment could occur.

### Indirect Impacts

- Disturbed soils above the stream banks would be vulnerable to erosion and could be washed into Mill Creek during storm events.
- The stream diversion and dewatering operations would disturb the stream channel substrate resulting in temporary increases in turbidity and suspended solids when the live stream is diverted and returned to its original channel and during the first high flows of the season when previously dry portions of the channel are wetted for the first time since being disturbed by construction activities.

#### **2.7.4. Avoidance, Minimization, and/or Mitigation Measures**

1. Vegetation removal would be limited to the extent necessary to complete the project.
2. Temporary ESA fencing would be installed to protect areas adjacent to the work from unnecessary disturbance.
3. Any material excavated from the stream channel to create the temporary diversion channel would be disposed of at an appropriate disposal area.
4. Clean materials, such as river cobbles and concrete K-rail, would be used for temporary stream crossing structures or stream diversion structures.
5. The contractor would be required to prepare and implement a SWPPP in accordance with the SWRCB's statewide NPDES Permit. The SWPPP would include appropriate temporary BMPs and would be subject to approval by the Caltrans Resident Engineer.
6. To address spills or leaks of fluids from vehicles or construction equipment, the contractor would be required to prepare a Spill Prevention Plan. The plan

would designate the personnel, action, and reporting in the event of a spill or leak.

7. The construction contract would include a special provision, “Temporary Clear Water Diversion System”. The special provision would require the contractor to prepare a dewatering plan, which would be subject to the approval of the Caltrans Resident Engineer and included in the SWPPP.

## **2.8. Air Quality**

### **2.8.1. Regulatory Setting**

The Clean Air Act as amended in 1990 is the federal law that governs air quality. Its counterpart in California is the California Clean Air Act of 1988. These laws set standards for the quantity of pollutants that can be in the air. At the federal level, these standards are called National Ambient Air Quality Standards (NAAQS). Standards have been established for six criteria pollutants that have been linked to potential health concerns; the criteria pollutants are: carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), particulate matter (PM), lead (Pb), and sulfur dioxide (SO<sub>2</sub>).

Under the 1990 Clean Air Act Amendments, the U.S. Department of Transportation cannot fund, authorize, or approve Federal actions to support programs or projects that are not first found to conform to State Implementation Plan for achieving the goals of the Clean Air Act requirements. Conformity with the Clean Air Act takes place on two levels—first, at the regional level and second, at the project level. The proposed project must conform at both levels to be approved.

Regional level conformity in California is concerned with how well the region is meeting the standards set for carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), and particulate matter (PM). California is in attainment for the other criteria pollutants. At the regional level, Regional Transportation Plans (RTP) are developed that include all of the transportation projects planned for a region over a period of years, usually at least 20. Based on the projects included in the RTP, an air quality model is run to determine whether or not the implementation of those projects would conform to emission budgets or other tests showing that attainment requirements of the Clean Air Act are met. If the conformity analysis is successful, the regional planning organization, such as the Tehama County Transportation Commission and the appropriate federal agencies, such as the Federal Highway Administration, make the determination that the RTP is in conformity with the State Implementation Plan for achieving the goals of the Clean Air Act. Otherwise, the projects in the RTP must

be modified until conformity is attained. If the design and scope of the proposed transportation project are the same as described in the RTP, then the proposed project is deemed to meet regional conformity requirements for purposes of project-level analysis.

Conformity at the project-level also requires “hot spot” analysis if an area is “nonattainment” or “maintenance” for carbon monoxide CO and/or particulate matter. A region is a “nonattainment” area if one or more monitoring stations in the region fail to attain the relevant standard. Areas that were previously designated as nonattainment areas but have recently met the standard are called “maintenance” areas. “Hot spot” analysis is essentially the same, for technical purposes, as CO or particulate matter analysis performed for NEPA purposes. Conformity does include some specific standards for projects that require a hot spot analysis. In general, projects must not cause the CO standard to be violated, and in “nonattainment” areas the project must not cause any increase in the number and severity of violations. If a known CO or particulate matter violation is located in the project vicinity, the project must include measures to reduce or eliminate the existing violation(s) as well.

### **2.8.2. Affected Environment**

The proposed project is located in Tehama County, which is an attainment/unclassified area for all current federal air quality standards. Therefore, conformity requirements do not apply.

Climate change is analyzed in Section 2.10 of this environmental document. Neither EPA or FHWA has promulgated explicit guidance or methodology to conduct project level greenhouse gas analysis. As stated on FHWA’s website (<http://www.fhwa.dot.gov/hep/climate/index.htm>), climate change considerations should be integrated throughout the transportation decision making process from planning through project development and delivery. Addressing climate change mitigation and adaptation up front in the planning process will facilitate decision making and improve efficiency at the program level, and will inform the analysis and stewardship needs of project level decision making. Climate change considerations can easily be integrated into many planning factors, such as supporting economic vitality and global efficiency, increasing safety and mobility, enhancing the environment, promoting energy conservation, and improving the quality of life.

Because there have been more requirements set forth in California legislation and executive orders regarding climate change, the issue is addressed in the CEQA chapter of this environmental document and may be used to inform the NEPA decision. The four strategies set forth by FHWA to lessen climate change impacts

do correlate with efforts that the State has undertaken and is undertaking to deal with transportation and climate change; the strategies include improved transportation system efficiency, cleaner fuels, cleaner vehicles, and reduction in the growth of vehicle hours travelled.

### **2.8.3. Environmental Consequences**

Alternative A would entail no immediate action to correct the bridge deficiencies and therefore would not affect air quality.

Alternative B would entail placement of RSP at the bridge foundations and rehabilitation of the bridge deck. The following construction activities could result in temporary increases in airborne dust:

- Excavations and grading
- Tracking mud or dirt onto the paved highway
- Grinding and removal of bridge deck surfacing

### **2.8.4. Avoidance, Minimization, and/or Mitigation Measures**

Caltrans specifications require the contractor to comply with regional air pollution rules. The contractor may use water and/or a palliative to suppress dust. In addition, if tracking soils onto the highway is a problem, the contractor may address this in the SWPPP by assigning appropriate BMPs to reduce or eliminate soil tracking.

The Environmental Protection Agency's (EPA) National Emissions Standards for Hazardous Air Pollutants (NESHAP) and the California Air Resources board (CARB) rules require the contractor to notify the CARB in writing prior to the demolition or renovation of any bridge regardless of whether or not asbestos is present. The contractor will be required to comply with any conditions imposed by the CARB.

## **2.9. Utilities**

### **2.9.1. Affected Environment**

Aerial electric and communication lines exist within the project limits on the south side of SR 36.

### **2.9.2. Environmental Consequences**

Alternative A would entail no immediate action to correct the bridge deficiencies and therefore would not affect utilities.

Alternative B would entail placement of RSP at the bridge foundations and rehabilitation of the bridge deck. If it is determined that the overhead lines would interfere with construction equipment operations at the project site, the respective utility companies would be requested to temporarily relocate the portion of the line in conflict with bridge construction. If required, it is anticipated that aerial lines would be relocated underground on the same alignment, with the exception of where they cross Mill Creek. At Mill Creek, the utility lines could be attached to the southern edge of the bridge deck. It is expected that any disruption to customer service resulting from the potential utility relocation would be minimal.

A wetland exists near the southwest quadrant of the highway bridge near an existing utility pole. The wetland could potentially be affected if utilities were relocated.

### **2.9.3. Avoidance, Minimization, and/or Mitigation Measures**

To protect the wetland in the event of a utility relocation, the utility contractor would be required to place an appropriate protective covering, such as a mat, over the wetland prior to accessing the area with vehicles or equipment.

## **2.10. Hazardous Waste**

Hazardous materials and hazardous wastes are regulated by many state and federal laws. These include not only statutes governing hazardous waste, but also a variety of laws regulating air and water quality, human health, and land use.

The primary federal laws regulating hazardous wastes/materials are the Resource Conservation and Recovery Act of 1976 (RCRA) and the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA). The purpose of CERCLA, often referred to as Superfund, is to clean up contaminated sites so that public health and welfare are not compromised. RCRA provides for “cradle to grave” regulation of hazardous wastes. Other federal laws include:

- Community Environmental Response Facilitation Act (CERFA) of 1992
- Clean Water Act
- Clean Air Act

- Safe Drinking Water Act
- Occupational Safety and Health Act (OSHA)
- Atomic Energy Act
- Toxic Substances Control Act (TSCA)
- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

In addition to the acts listed above, Executive Order 12088, Federal Compliance with Pollution Control, mandates that necessary actions be taken to prevent and control environmental pollution when federal activities or federal facilities are involved.

Hazardous waste in California is regulated primarily under the authority of the federal Resource Conservation Recovery Act of 1976, and the California Health and Safety Code. Other California laws that affect hazardous waste are specific to handling, storage, transportation, disposal, treatment, reduction, cleanup, and emergency planning.

Worker health and safety and public safety are key issues when dealing with hazardous materials that may affect human health and the environment. Proper disposal of hazardous material is vital if it is disturbed during project construction.

### **2.10.1. Affected Environment**

Thermoplastic paint used for highway striping within the project limits may contain lead. The concentration of lead could vary depending upon color, type, and year of manufacture.

Earthen shoulders and soil immediately adjacent to the roadway may contain traces of lead, a product of motor vehicle exhaust from the period when leaded gasoline was in use.

Asbestos containing materials (ACM) may be present in shims beneath bridge railing, bridge deck joint filler, or aggregate within Portland cement concrete.

Guardrail and sign posts within the project limits utilize wood treated with a chemical preservative.

### **2.10.2. Environmental Consequences**

Alternative A would entail no immediate action to correct the bridge deficiencies and therefore would not involve hazardous waste issues.

Alternative B would entail placement of RSP at the bridge foundations and rehabilitation of the bridge deck. An Initial Site Assessment (ISA) was conducted to determine if potential sources of hazardous waste exist within the limits of the proposed project. The ISA concluded that the project site is not listed on the April 1998 State List of Hazardous Waste Sites, also referred to as the “Cortese List.” The following potential hazardous waste issues were identified:

- Lead containing paint
- Lead in soil
- Asbestos containing materials
- Treated wood waste

#### **Lead Containing Paint**

Rehabilitation of the bridge deck would include removal of the painted centerline and fog lines on the bridge deck surface in addition to the existing AC surfacing. The concentration of lead in the debris could vary depending upon paint color, type, and year of manufacture and whether the paint was removed exclusive of the AC, such as by abrasive blasting, or the paint is ground off combined with AC pavement. It is anticipated that the paint striping would be removed in combination with the AC surfacing by grinding, thereby reducing the concentration of lead containing paint.

#### **Lead in Soil**

Soil adjacent to the highway would be excavated and graded to create temporary construction access roads from the north and south sides of the highway to the eastern bank of Mill Creek. In addition, earthen shoulders would be repaired and regraded once the scour repair and deck rehabilitation work are completed.

#### **Asbestos Containing Material**

Rehabilitation of the bridge deck would include the removal and replacement of any unsound PCC, which could disturb asbestos containing aggregates. The bridge deck joint seals/filler would be replaced. In addition, the replacement or adjustment of bridge railing would involve disturbance of shims.

### **Treated Wood Waste**

Metal beam guardrail abutting the bridge, including chemically treated wooden posts, would be replaced or adjusted during the bridge deck rehabilitation.

## **2.10.3. Avoidance, Minimization, and/or Mitigation Measures**

### **Lead Containing Paint**

If thermoplastic paint were removed in combination with AC pavement and it was determined that lead concentrations were below the hazardous waste threshold, the contractor would be required to implement a lead compliance plan prepared by a certified industrial hygienist. If thermoplastic paint were removed exclusive of AC pavement, the paint debris would be treated as hazardous waste. The construction contract would include special provisions that would require the contractor to develop a lead compliance plan and comply with applicable state and federal laws governing the handling and disposal of hazardous waste.

### **Lead in Soil**

Soil within the project limits would be tested for the presence of lead prior to construction. It is anticipated that lead would be present in concentrations below the hazardous waste threshold i.e., below 1,000mg/kg total lead and below 5 mg/l soluble lead. If lead is found to be present in levels below the hazardous waste threshold, a special provision would be included in the project to require the contractor to implement a lead compliance plan prepared by a certified industrial hygienist.

### **Asbestos Containing Material**

The Environmental Protection Agency's (EPA) National Emissions Standards for Hazardous Air Pollutants (NESHAP) and the California Air Resources board (CARB) rules require the contractor to notify the CARB in writing prior to the demolition or renovation of any bridge regardless of whether or not asbestos is present. The contractor will be required to comply with any conditions imposed by the CARB.

### **Treated Wood Waste**

The construction contract would include special provisions regarding the appropriate storage and disposal of any treated wood waste generated by the project.

## **2.11. Climate Change (CEQA)**

While climate change has been a concern since at least 1988, as evidenced by the establishment of the United Nations and World Meteorological Organization's Intergovernmental Panel on Climate Change (IPCC), the efforts devoted to greenhouse gas (GHG) emissions reduction and climate change research and policy have increased dramatically in recent years. These efforts are primarily concerned with the emissions of GHG related to human activity that include carbon dioxide (CO<sub>2</sub>), methane, nitrous oxide, tetrafluoromethane, hexafluoroethane, sulfur hexafluoride, HFC-23 (fluoroform), HFC-134a (s, s, s, 2 –tetrafluoroethane), and HFC-152a (difluoroethane).

In 2002, with the passage of Assembly Bill 1493 (AB 1493), California launched an innovative and pro-active approach to dealing with GHG emissions and climate change at the state level. Assembly Bill 1493 requires the California Air Resources Board (CARB) to develop and implement regulations to reduce automobile and light truck GHG emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with the 2009-model year; however, in order to enact the standards California needed a waiver from the U.S. Environmental Protection Agency (EPA). The waiver was denied by EPA in December 2007. See *California v. Environmental Protection Agency*, 9th Cir. Jul. 25, 2008, No. 08-70011. However, on January 26, 2009, it was announced that EPA will reconsider their decision regarding the denial of California's waiver. On May 18, 2009, President Obama announced the enactment of a 35.5 mpg fuel economy standard for automobiles and light duty trucks which will take effect in 2012. On June 30, 2009, EPA granted California the waiver. California is expected to enforce its standards for 2009 to 2011 and then look to the federal government to implement equivalent standards for 2012 to 2016. The granting of the waiver will also allow California to implement even stronger standards in the future. The State is expected to start developing new standards for the post-2016 model years later this year.

On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05. The goal of this Executive Order is to reduce California's GHG emissions to: 1) 2000 levels by 2010, 2) 1990 levels by the 2020 and 3) 80 percent below the 1990 levels by the year 2050. In 2006, this goal was further reinforced with the passage of Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006. AB 32 sets the same overall GHG emissions reduction goals while further mandating that CARB create a plan, which includes market mechanisms, and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." Executive Order S-20-06 further directs state agencies to begin implementing AB 32, including the recommendations made by the state's Climate Action Team.

With Executive Order S-01-07, Governor Schwarzenegger set forth the low carbon fuel standard for California. Under this executive order, the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by 2020.

Climate change and GHG reduction is also a concern at the federal level; however, at this time, no legislation or regulations have been enacted specifically addressing GHG emissions reductions and climate change. California, in conjunction with several environmental organizations and several other states, sued to force the U.S. Environmental Protection Agency (EPA) to regulate GHG as a pollutant under the Clean Air Act (*Massachusetts vs. Environmental Protection Agency et al.*, 549 U.S. 497 (2007)). The court ruled that GHG does fit within the Clean Air Act's definition of a pollutant, and that the EPA does have the authority to regulate GHG. Despite the Supreme Court ruling, there are no promulgated federal regulations to date limiting GHG emissions.

On December 7, 2009, the EPA Administrator signed two distinct findings regarding greenhouse gases under Section 202(a) of the Clean Air Act:

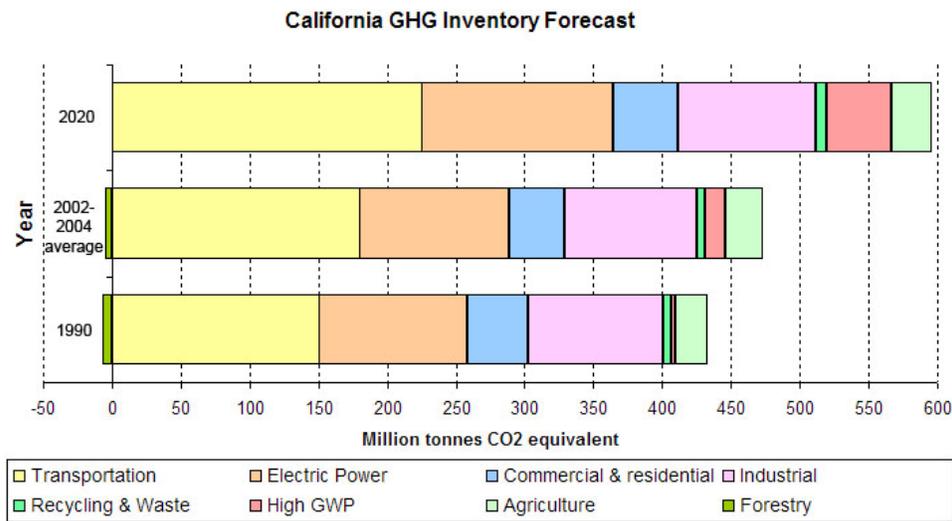
- **Endangerment Finding:** The Administrator finds that the current and projected concentrations of the six key well-mixed greenhouse gases [carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>)] in the atmosphere threaten the public health and welfare of current and future generations.
- **Cause and Contribute Finding:** The Administrator finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.

These findings do not themselves impose any requirements on industry or other entities. However, this action is a prerequisite to finalizing the EPA's proposed greenhouse gas emission standards for light-duty vehicles, which were jointly proposed by EPA and the Department of Transportation's National Highway Safety Administration on September 15, 2009.

According to Recommendations by the Association of Environmental Professionals on How to Analyze GHG Emissions and Global Climate change in CEQA Documents (March 5, 2007), an individual project does not generate enough GHG emissions to significantly influence global climate change. Rather, global climate change is a cumulative impact. This means that a project may participate in a potential impact through its incremental contribution combined with the contributions of all other sources of GHG. In assessing cumulative impacts, it must be determined if a

project’s incremental effect is “cumulatively considerable.” See CEQA Guidelines sections 15064(i)(1) and 15130. To make this determination the incremental impacts of the project must be compared with the effects of past, current, and probable future projects. To gather sufficient information on a global scale of all past, current, and future projects in order to make this determination is a difficult if not impossible task.

As part of its supporting documentation for the Draft Scoping Plan, CARB recently released an updated version of the GHG inventory for California (June 26, 2008). Shown below is a graph from that update that shows the total GHG emissions for California for 1990, 2002-2004 average, and 2020 projected if no action is taken.



**FIGURE 1 CALIFORNIA GREENHOUSE GAS INVENTORY**

Taken from : <http://www.arb.ca.gov/cc/inventory/data/forecast.htm>

Caltrans and its parent agency, the Business, Transportation, and Housing Agency, have taken an active role in addressing GHG emission reduction and climate change. Recognizing that 98 percent of California’s GHG emissions are from the burning of fossil fuels and 40 percent of all human made GHG emissions are from transportation (see Climate Action Program at Caltrans (December 2006), Caltrans has created and is implementing the Climate Action Program at Caltrans that was published in December 2006. This document can be found at:

<http://www.dot.ca.gov/docs/ClimateReport.pdf>

## **Project Analysis**

The proposed project is not capacity increasing. The project includes only rehabilitation of an already existing bridge deck and placement of rock to protect the existing bridge foundations. Therefore, the proposed project would not alter the operational characteristics of the highway and no changes in post-construction operational GHG emissions are anticipated. In fact, one benefit of the project would be the replacement of the existing AC deck surface with a polyester overlay. A polyester overlay would provide a superior wear surface and weather protection barrier, which in turn would prolong the life of the bridge deck.

## **Construction Emissions**

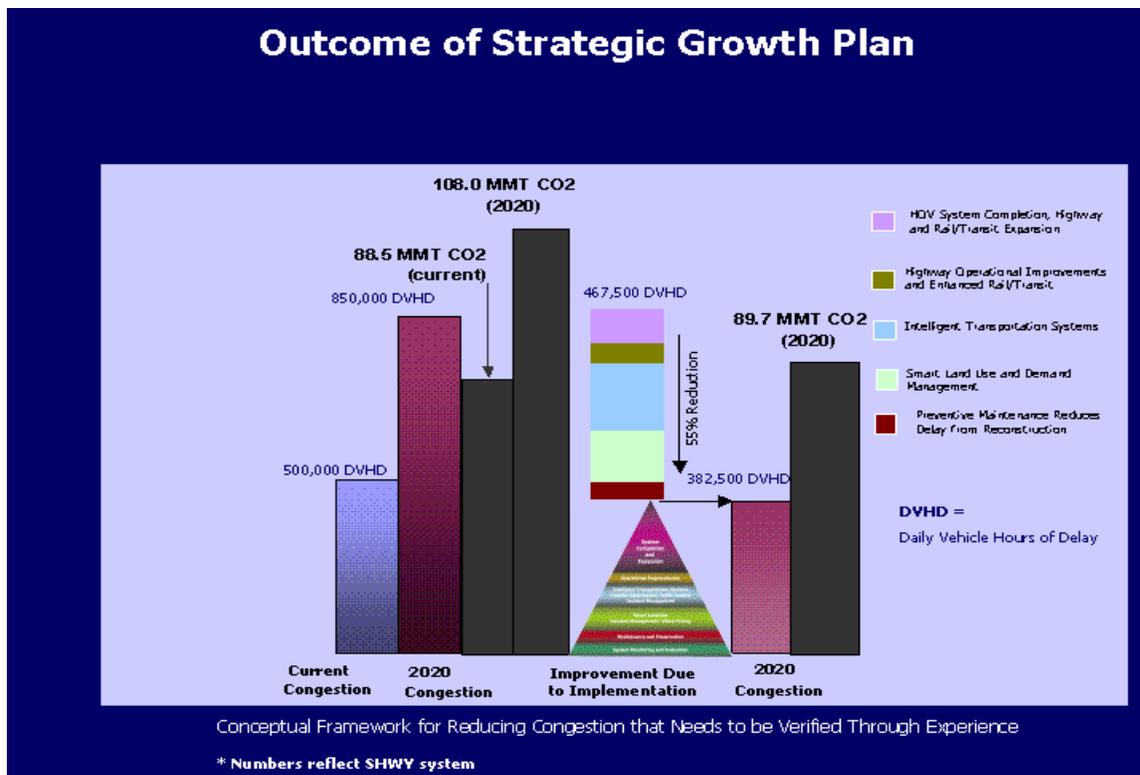
GHG emissions for transportation projects can be divided into those produced during construction and those produced during operations. Construction GHG emissions include emissions produced as a result of material processing, emissions produced by onsite construction equipment, and emissions arising from traffic delays due to construction.

Emissions from traffic and construction equipment will be produced at different levels throughout the construction phase; their frequency and occurrence can be reduced through innovations in plans and specifications and by implementing better traffic management during construction phases. In addition, with innovations such as longer pavement lives, improved traffic management plans, and changes in materials, the GHG emissions produced during construction can be mitigated to some degree by longer intervals between maintenance and rehabilitation events.

## **AB 32 Compliance**

Caltrans continues to be actively involved on the Governor's Climate Action Team as CARB works to implement the Governor's Executive Orders and help achieve the targets set forth in AB 32. Many of the strategies Caltrans is using to help meet the targets in AB 32 come from the California Strategic Growth Plan, which is updated each year. Governor Arnold Schwarzenegger's Strategic Growth Plan calls for a \$238.6 billion infrastructure improvement program to fortify the state's transportation system, education, housing, and waterways, including \$107 billion in transportation funding during the next decade. As shown on the figure below, the Strategic Growth Plan targets a significant decrease in traffic congestion below today's level and a corresponding reduction in GHG emissions. The Strategic Growth Plan proposes to do this while accommodating growth in population and the economy. A suite of investment options has been created that combined together yield the promised reduction in congestion. The Strategic Growth Plan relies on a complete systems

approach of a variety of strategies: system monitoring and evaluation, maintenance and preservation, smart land use and demand management, and operational improvements.



**FIGURE 2 OUTCOME OF STRATEGIC GROWTH PLAN**

As part of the Climate Action Program at Caltrans (December 2006, <http://www.dot.ca.gov/docs/ClimateReport.pdf>), Caltrans is supporting efforts to reduce vehicle miles traveled by planning and implementing smart land use strategies: job/housing proximity, developing transit-oriented communities, and high density housing along transit corridors. Caltrans is working closely with local jurisdictions on planning activities; however, Caltrans does not have local land use planning authority. Caltrans is also supporting efforts to improve the energy efficiency of the transportation sector by increasing vehicle fuel economy in new cars, light and heavy-duty trucks; Caltrans is doing this by supporting on-going research efforts at universities, by supporting legislative efforts to increase fuel economy, and by its participation on the Climate Action Team. It is important to note, however, that the control of the fuel economy standards is held by EPA and CARB. Lastly, the use of alternative fuels is also being considered; the Department is participating in funding for alternative fuel research at the UC Davis.

Table 1 summarizes the Department and statewide efforts that Caltrans is implementing in order to reduce GHG emissions. For more detailed information about each strategy, please see Climate Action Program at Caltrans (December 2006); it is available at <http://www.dot.ca.gov/docs/ClimateReport.pdf>



TABLE 1 CLIMATE CHANGE STRATEGIES

Strategy	Program	Partnership		Method/Process	Estimated CO <sub>2</sub> Savings (MMT)	
		Lead	Agency		2010	2020
Smart Land Use	Intergovernmental Review (IGR)	Caltrans	Local Governments	Review and seek to mitigate development proposals	Not Estimated	Not Estimated
	Planning Grants	Caltrans	Local and regional agencies & other stakeholders	Competitive selection process	Not Estimated	Not Estimated
	Regional Plans and Blueprint Planning	Regional Agencies	Caltrans	Regional plans and application process	0.975	7.8
Operational Improvements & Intelligent Trans. System (ITS) Deployment	Strategic Growth Plan	Caltrans	Regions	State ITS; Congestion Management Plan	.007	2.17
Mainstream Energy & GHG into Plans and Projects	Office of Policy Analysis & Research; Division of Environmental Analysis	Interdepartmental effort		Policy establishment, guidelines, technical assistance	Not Estimated	Not Estimated
Educational & Information Program	Office of Policy Analysis & Research	Interdepartmental, CalEPA, CARB, CEC		Analytical report, data collection, publication, workshops, outreach	Not Estimated	Not Estimated
Fleet Greening & Fuel Diversification	Division of Equipment	Department of General Services		Fleet Replacement B20 B100	0.0045	0.0065 0.45 .0225
Non-vehicular Conservation Measures	Energy Conservation Program	Green Action Team		Energy Conservation Opportunities	0.117	.34
Portland Cement	Office of Rigid Pavement	Cement and Construction Industries		2.5 % limestone cement mix 25% fly ash cement mix > 50% fly ash/slag mix	1.2 .36	3.6
Goods Movement	Office of Goods Movement	Cal EPA, CARB, BT&H, MPOs		Goods Movement Action Plan	Not Estimated	Not Estimated
Total					2.72	18.67



## **Adaptation Strategies**

“Adaptation strategies” refer to how Caltrans and others can plan for the effects of climate change on the state’s transportation infrastructure and strengthen or protect the facilities from damage. Climate change is expected to produce increased variability in precipitation, rising temperatures, rising sea levels, storm surges and intensity, and the frequency and intensity of wildfires. These changes may affect the transportation infrastructure in various ways, such as damaging roadbeds by longer periods of intense heat; increasing storm damage from flooding and erosion; and inundation from rising sea levels. These effects will vary by location and may, in the most extreme cases, require that a facility be relocated or redesigned. There may also be economic and strategic ramifications as a result of these types of impacts to the transportation infrastructure.

Climate change adaption must also involve the natural environment as well. Efforts are underway on a statewide-level to develop strategies to cope with impacts to habitat and biodiversity through planning and conservation. The results of these efforts will help California agencies plan and implement mitigation strategies for programs and projects.

On November 14, 2008, Governor Schwarzenegger signed Executive Order S-13-08 which directed a number of state agencies to address California’s vulnerability to sea level rise caused by climate change.

The California Resources Agency [now the Natural Resources Agency, (Resources Agency)], through the interagency Climate Action Team, was directed to coordinate with local, regional, state and federal public and private entities to develop a state Climate Adaptation Strategy. The Climate Adaptation Strategy will summarize the best known science on climate change impacts to California, assess California's vulnerability to the identified impacts and then outline solutions that can be implemented within and across state agencies to promote resiliency.

As part of its development of the Climate Adaptation Strategy, Resources Agency was directed to request the National Academy of Science to prepare a Sea Level Rise Assessment Report by December 2010 to advise how California should plan for future sea level rise. The report is to include:

- relative sea level rise projections for California, taking into account coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge and land subsidence rates;
- the range of uncertainty in selected sea level rise projections;

- a synthesis of existing information on projected sea level rise impacts to state infrastructure (such as roads, public facilities and beaches), natural areas, and coastal and marine ecosystems;
- a discussion of future research needs regarding sea level rise for California.

Furthermore Executive Order S-13-08 directed the Business, Transportation, and Housing Agency to prepare a report to assess vulnerability of transportation systems to sea level affecting safety, maintenance and operational improvements of the system and economy of the state. The Caltrans continues to work on assessing the transportation system vulnerability to climate change, including the effect of sea level rise.

## **2.12. Cumulative Impacts**

### **2.12.1. Regulatory Setting**

Cumulative impacts are those that result from past, present, and reasonably foreseeable future actions, combined with the potential impacts of this project. A cumulative effect assessment looks at the collective impacts posed by individual land use plans and projects. Cumulative impacts can result from individually minor, but collectively substantial impacts taking place over a period of time.

Cumulative impacts to resources in the project area may result from residential, commercial, industrial, and highway development, as well as from agricultural development and the conversion to more intensive types of agricultural cultivation. These land use activities can degrade habitat and species diversity through consequences such as displacement and fragmentation of habitats and populations, alteration of hydrology, contamination, erosion, sedimentation, disruption of migration corridors, changes in water quality, and introduction or promotion of predators. They can also contribute to potential community impacts identified for the project, such as changes in community character, traffic patterns, housing availability, and employment.

CEQA Guidelines, Section 15130, describes when a cumulative impact analysis is warranted and what elements are necessary for an adequate discussion of cumulative impacts. The definition of cumulative impacts, under CEQA, can be found in Section 15355 of the CEQA Guidelines. A definition of cumulative impacts, under NEPA, can be found in 40 CFR, Section 1508.7 of the CEQ Regulations.

### **2.12.2. Affected Environment**

The proposed project, Alternative B, entails scour repair and maintenance of an existing bridge on a rural two-lane highway. The bridge spans Mill Creek, a perennial stream that supports listed salmonids. Habitat for willow flycatcher, another listed species, exists near the southeast quadrant of the bridge. Land use in the project area includes state highway operations and agriculture. Erosive volcanic soils at the headwaters of Mill Creek contribute to naturally elevated turbidity levels<sup>1</sup>. Potential past, present, and future projects in the vicinity of the Mill Creek Bridge would include highway maintenance, underground and overhead utility work, and agricultural operations. Past projects and foreseeable future projects undertaken by Caltrans include routine highway maintenance, such as bridge deck and pavement rehabilitation, shoulder grading, and clearing storm debris from the pier and abutments of the highway bridge.

### **2.12.3. Environmental Consequences**

Alternative A would entail no immediate action to correct the bridge deficiencies and therefore would not contribute to cumulative effects.

Alternative B would entail placement of RSP at the bridge foundations and rehabilitation of the bridge deck. The proposed project in its completed state would not result in or contribute to an adverse effect upon the environment. Although specifications and special provisions to avoid impacts to listed species and water quality will be included in the project plans and specifications, the construction process could result in short-term direct and indirect impacts to water quality and listed species, including salmonids and the willow flycatcher. A complete discussion of potential impacts is included in the respective sections of this draft IS/EA.

Potential direct impacts to water quality include short-term increases in turbidity and suspended particles due to the placement of temporary fills in surface waters relative to stream diversions and dewatering operations. Indirect impacts may include erosion and sediment transport when storm water and/or stream flows come in contact with soils and streambed substrate that had been disturbed during construction. Water quality impacts could also result from spills or leakage of petroleum products from construction equipment. The minor, short-term effects expected to result from the construction process would be negligible.

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<sup>1</sup> Armentrout et al, Lassen National Forest, Almanor Ranger District, 1998. Watershed Analysis for Mill, Deer, and Antelope Creeks.

Potential direct impacts to listed salmonids would include mortality due to stream diversions and dewatering. Indirect impacts could occur due to temporary increases in turbidity and suspended particles. Communication between breeding willow flycatchers could be affected by construction activities and noise. The minor, short-term effects expected to result from the construction process would be negligible.

**2.12.4. Avoidance, Minimization, and/or Mitigation Measures**

The project includes specifications and special provisions to ensure that potentially cumulative or long-term adverse effects would be avoided. Avoidance and minimization measures are specified in Sections 2.3.4.1, 2.3.4.2, and 2.7.4 of this Draft IS/EA.