Hydroacoustic Monitoring Plan for the Ten Mile River Bridge Replacement Project

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Prepared for

California Department of Transportation – District 1
Office of Environmental Management, E2
1656 Union Street
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EXHIBIT NO. **1 (Part 1)**
APPLICATION NO.
1-06-022 – CALTRANS
CONDITION COMPLIANCE
HYDROACOUSTIC
MONITORING PLAN (1 of 11)

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INTRODUCTION

This document includes an assessment of potential underwater noise levels generated by planned construction activities involved with the Ten Mile River Seismic Replacement project and the plan for monitoring pile driving noise during construction.

The assessment of potential underwater construction noise was prepared in October 2005 to assist Caltrans biologists in their evaluation of noise impacts to fish needed to complete the Federal and State endangered species consultation for construction of the Ten Mile River Seismic Bridge Replacement. It reviews various pile driving strategies and provides an estimate of underwater noise levels expected during construction at Ten Mile River. The hydroacoustic monitoring plan documents how underwater sound pressures will be measured to assess underwater noise impacts from pile driving activities associated with the construction of the Ten Mile River replacement bridge. There are two types of piles being driven for the project, temporary piles and permanent piles. Underwater sound measurements would be made for the placement of the two types of piles. Underwater noise monitoring would include the measurement of peak sound pressures, root mean square ($RMS_{impulse}$) sound pressure levels and sound energy levels (SEL).

FUNDAMENTALS OF UNDERWATER NOISE

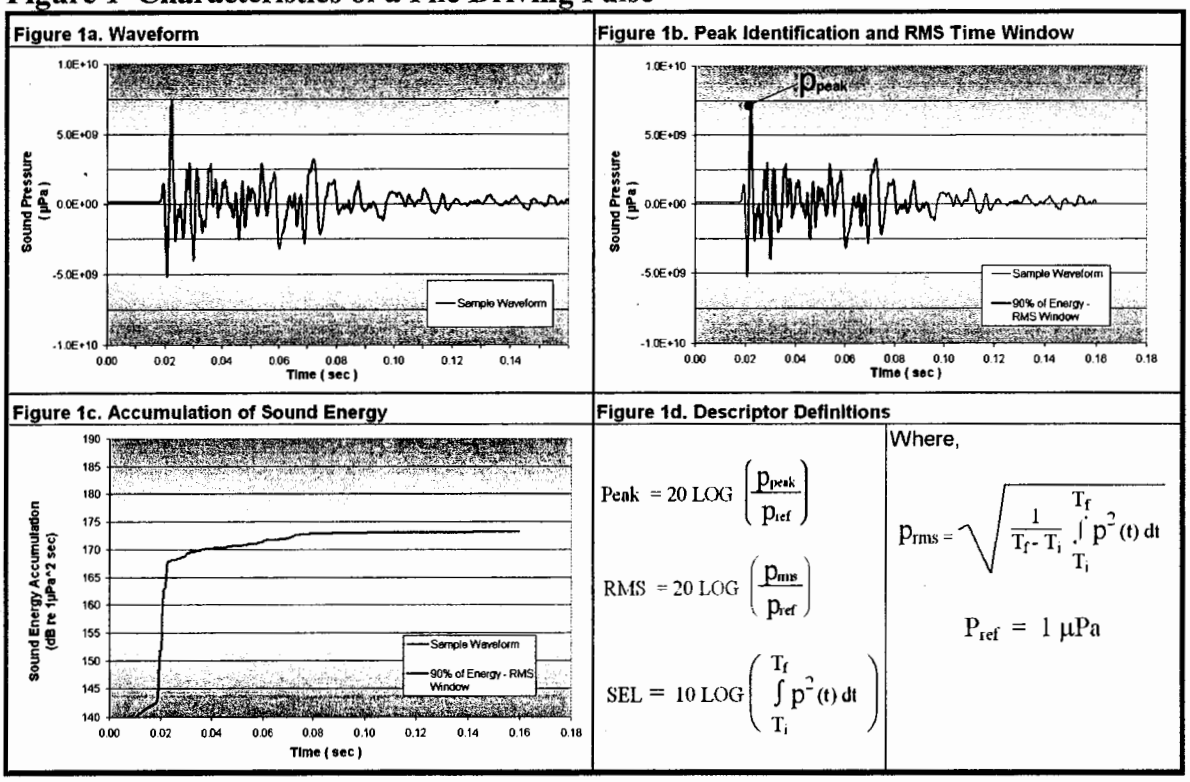
Underwater Sound Descriptors

When a pile driving hammer strikes a pile, an acoustic pulse is created that propagates through the pile and radiates into the water and it vibrates the ground substrate causing radiated noise into the water. The sound is also radiated into the air. The underwater sound pressure pulse represented in the time domain is referred to as the waveform. The peak pressure is the highest absolute pressure during a pulse. The RMS level for the pulse is calculated by computing the average of the squared pressures over the time that comprise the portion of the waveform containing 90 percent of the sound energy (Richardson *et al* 1995). This RMS term is described as $RMS_{90\%}$ in this report. This can be approximated for pile driving by measuring the signal with a precision sound level meter set to the "impulse" RMS setting (RMS). Peak pressures and RMS sound pressure levels are expressed in decibels re 1 μPa. Another measure of the pressure waveform that can be used to describe the pulse is the sound energy itself. The sound energy in the pulse is described by researchers using various terms. In this report, the un-weighted sound exposure level (SEL), a common unit of sound energy used in airborne acoustics to describe short-duration events, is reported as a measure of sound energy. The unit is dB re $1 \mu Pa^2$-sec. Table 1 includes definitions of common descriptors used to describe underwater environmental sounds. Figure 1 illustrates the different descriptors used to describe sounds from pile driving impacts.

Table 1 - Definitions of Underwater acoustical terms

TERM	DEFINITIONS
Peak Sound Pressure, unweighted (NMFS Criterion) dB re 1 μPa	Peak sound pressure level based on the largest absolute value of the instantaneous sound pressure. This pressure is expressed in this report as a decibel (referenced to a pressure of 1 μPa) but can also be expressed in units of pressure, such as μPa or PSI.
RMS Sound Pressure Level, (NMFS Criterion) dB re 1 μPa	The average of the squared pressures over the time that comprise that portion of the waveform containing 90 percent of the sound energy for one pile driving impulse[1].
Total Acoustic Energy (SEL), dB re 1 μPa^2 sec	Proportionally equivalent to the time integral of the pressure squared and is described in this report in terms of μPa^2 sec over the duration of the impulse. Similar to the unweighted Sound Exposure Level (SEL) standardized in airborne acoustics to study noise from single events.
Waveforms, μPa over time	A graphical plot illustrating the time history of positive and negative sound pressure of individual pile strikes shown as a plot of μPa over time (i.e., seconds)
Frequency Spectra, dB over frequency range	A graphical plot illustrating the distribution of sound pressure vs. frequency for a waveform, dimension in rms pressure and defined frequency bandwidth

Figure 1 Characteristics of a Pile Driving Pulse



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[1] The underwater sound measurement results obtained from impact pile driving projects indicated that most energy from pile driving pulses occurs over a 30- to 50-millisecond (msec) period. Analysis of that underwater acoustic data for various pile strikes indicates that the signal measured using the standard "impulse exponential-time-weighting" (35-msec rise time) correlates generally well to the RMS level measured over the duration of the pulse.

PROJECT DESCRIPTION

The Department is planning to replace the existing Ten Mile River bridge located on State Route 1 in Mendocino County between KP 111.7/112.9 (PM 69.2/70.1) approximately 488 meters (1,600 feet) from the Pacific Ocean at the Ten Mile River estuary (Inglenook USGS 7.5 minute quadrangle, T20N, R17W, Section 33). The project involves the installation of a new bridge over the Ten Mile River and demolition of the existing bridge. The new bridge will be constructed on an alignment 17 meters (56 feet) (centerline to centerline) upstream from the existing bridge. The new bridge will be approximately 451 meters (1,480 feet) long with two 3.6-meter (11.8-foot) lanes, and two 1.8-meter (6-foot) shoulders. A five-foot pedestrian walkway and an approximately 1.6-foot safety barrier between the walkway and the highway shoulder will be constructed on the west side of the bridge.

The new bridge will have an eight-span superstructure (the bridge deck) supported by three piers (middle supports in the river), four bents (middle supports on land) and two abutments (the end supports). Plans call for each pier and bent to be comprised of two columns, each of which will be supported on approximately 32 permanent 0.76-meter (30-inch) diameter Cast in Steel Shell (CISS) piles. Temporary H piles will be required for construction of temporary false work and temporary work trestles. Cofferdams constructed from sheet piles will also be required to construct the new bridge piers and likely bent 5 and remove the existing bridge piers and bents.

ANALYSIS OF POTENTIAL UNDERWATER CONSTRUCTION NOISE

As discussed at the meeting with CDFG, U.S. Fish and Wildlife Service, and NOAA Fisheries on August 24, 2005, data gathered by Illingworth & Rodkin, Inc. (I&R) since the BA was published indicates that the 190 dB peak threshold used in the BA could be exceeded during driving of both temporary H piles (peak SPLs of 185-198 dB at 10 meters), and permanent 30-inch CISS piles in dewatered cofferdam (peak SPLs up to 190 dB at 10 meters). If steel pipe piles are used instead of H piles for the temporary piles, data gathered by I&R indicates expected peak SPLs would be up to 205 dB at 10 meters.

In general, measurements have shown that for piles in water, sound pressure levels drop off with distance at a rate of about 5 to 7 dB for each doubling of distance. The drop off rate measured in shallower water at Noyo River, that is similar to Ten Mile River, was about 8 dB per doubling of distance. The permanent 30-inch CISS piles will be driven in cofferdams dewatered to below the exterior existing mudline. There will be no direct sound radiation from the pile pulse into the river water. For these piles, low frequency ground-radiated noise would result from vibration propagating through the ground and into the shallow water. Attenuation rates vary considerably depending on the substrate but typically attenuate at rates of 6 to 10 dB per doubling of distance. Using the data at 10 meters, and these various propagation rates, approximate distances to the 190 dB peak and 180 dB peak SPLs for temporary H piles, temporary pipe piles, and permanent 30-inch CISS piles driven in cofferdams dewatered to below the existing mudline have been determined (see Table 1).

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Data is also presented for temporary piles with an attenuation system. The proposed attenuation system is a double walled isolation casing (DWIC) with an air space that does not include a

bubble ring. The DWIC placed around the pile utilizes the air space between the two walls of the isolation casing to provide the attenuation. This system is not dewatered. This system was utilized at Humboldt Bay and found to provide about 9 dB of attenuation. Data for this attenuator is included because in previous discussions it was determined that the use of a confined or unconfined bubble ring would cause serious turbidity issues. The DWIC does not utilize a bubble curtain, avoiding turbidity problems. While data are provided for this attenuation system, we do not know whether or not it is a feasible mitigation measure for this project. The driving of permanent piles inside a cofferdam dewatered down to below the existing mudline, and the driving of H piles through a DWIC, should not cause peak pressures over 190 dB at 10 meters. There is almost no possibility of exceeding peak pressures of 200 dB at 10 meters.

Root mean square (RMS) sound pressures were also presented in the BA. For temporary H piles, the RMS pressures are estimated to be 15 to 20 dB below the peak pressures; for temporary pipe piles, the RMS pressures are estimated to be 15 dB below peak pressures; for permanent CISS piles driven in cofferdams dewatered to below the existing mudline, the RMS pressures are estimated to be 11 to 13 dB less than peak pressures.

Other attenuation options were evaluated. First, for permanent piles driven in a cofferdam dewatered to below the existing mudline, there are no additional measures that we can recommend to further reduce underwater sound pressure levels. Second, for temporary H piles driven in shallow water, our review of bubble curtain data indicates attenuation on the same order as the DWIC.

Caltrans retained Dr. Arthur Popper and Dr. Mardi Hastings through a subcontract with Jones & Stokes to conduct a thorough evaluation of available information relating to the effects of pile driving sound on fish. A Fisheries Hydroacoustic Working Group was formed to direct and evaluate the work. Mr. David Buehler of Jones & Stokes Associates summarizes the key agreements from the meeting of the Fisheries Hydroacoustic Working Group as follows:

(1) Sound exposure level (SEL), as defined in the Hastings and Popper report, is the best noise metric currently available for this application.

(2) The report prepared and presented by Hastings and Popper superbly summarizes and critiques all relevant data.

(3) Data currently available is very limited and that pending the completion of the desired scientific research, the recommended interim guidance in the report would start to move the assessment process toward the utilization of the SEL metric.

The draft monitoring plan, described below and attached to this memo, includes the measurement of sound exposure level (SEL) in addition to instantaneous peak and RMS sound pressure levels. SEL data will be gathered for single strikes and accumulated during the driving of each representative pile. Data gathered for this project can, therefore, be evaluated with respect to the Interim Guidance presented in the Hastings and Popper report, as well as against the instantaneous peak SPL threshold established for the project.

The draft Hydroacoustic Monitoring Plan for the Ten Mile River Bridge includes recommendations regarding the number of measurements and measurement locations for

temporary piles and permanent piles. These recommendations are based on extensive prior experience with acoustical monitoring for pile driving projects and would provide a defensible and representative data set.

Table 2
Estimated Distances to Instantaneous Peak Sound Pressures of 190 dB and 180 dB (re 1 μPa) for Impact Pile Driving at Ten Mile River Replacement Bridge

		Estimated Distance (meters)	
Source	Source Level (10 meters)	To 190 dB Peak	To 180 dB Peak
Temporary H Piles – Unattenuated	185-198 dB		
- 5 dB drop off rate		<10m – 30m	20m – 120m
- 8 dB drop off rate		<10m – 20m	15m – 50m
Temporary Pipe Piles – Unattenuated	205 dB		
- 5 dB drop off rate		80m	320m
- 8 dB drop off rate		40m	90m
Temporary H Piles – Attenuated with DWIC	176-189 dB		
- 5 dB drop off rate		<10m	<10m – 35m
- 8 dB drop off rate		<10m	<10m – 20m
Temporary Pipe Piles – Attenuated with DWIC	196 dB		
- 5 dB drop off rate		25m	90m
- 8 dB drop off rate		20m	40m
Permanent 30-inch CISS Piles in Cofferdam Dewatered to below existing mudline	190 dB		
- 6 dB drop off rate		10m	35m
- 10 dB drop off rate		10m	20m

Note: Distances rounded to nearest 5 meter.

HYDROACOUSTIC MONITORING STUDY METHODS

The acoustic footprint for both temporary and permanent pile driving will be determined by measurements at various locations. Fish injury criteria threshold for the Ten Mile River Bridge project has been set at 190 dB peak as shown in the National Marine Fisheries Services (NMFS) biological opinion and the California Department of Fish and Game (CDFG) 2081 Incidental Take Permit. Additionally, please refer to the "Fish Relocation, Avian and Marine Predation, and Water Temperature Monitoring Plans for the Ten Mile River Bridge Replacement Project" for more information.

Temporary and permanent pile driving study methods are described below.

General Monitoring Methodology

Measurements would be made at reference distances of 10 meters (m) and at other various distances including 100 meters both upstream and downstream and at both edges of the Ten Mile River when possible. Distances are determined using a hand held range finder which is accurate to +/- 1 meter at distances up to 500 meters. There will be a fixed measuring location at 10 meters from the source to monitor the actual pile driving noise level and then to compare it to threshold levels. See the following sections for the exact methodology to be used with the permanent and temporary piles. Changes to this monitoring process may be necessary to fit site conditions. For instance, all hydroacoustic noise monitoring will be conducted in the Ten Mile River. So monitoring of land based pile driving at Bent 5, will be measured at a minimum distance from the source of 25 meters, or at the closest location that meets general monitoring methodology such as a minimum of 1 meter water depth.

An attempt will be made to measure closer than 10m when it is logically feasible and when the following conditions are met:

1) The Caltrans Resident Engineer, the construction representative and personnel measuring the underwater sound pressure agree that it does not compromise the workers' safety,

2) It does not put the equipment for measuring the underwater sound pressure in a position that would either delay the contractor or cause damage to the equipment.

The measurement depth will be 1 m from the bottom in water depths of 2 m or greater. In shallower water, the measurement position will be mid-depth. The hydrophone line is attached to a secondary line which has a weight attached to the end of it. The hydrophone is located on the secondary line at a distance of 1 meter from the bottom of the weight. In this way, when the weight touches the bottom, the line can be tied off and the hydrophone height determined above the bottom. The hydrophone line is marked with 1 meter markings, so the depth of the water at the measurement positions can also be determined from the secondary line. No measurements will be made in water less than 1m in depth. Noise levels are irregular near the surface of a water column due to the "pressure release" caused by the difference in density between the air and the water.

Both temporary and permanent piles will be driven through attenuation systems that will separate the piles from the surrounding water. The radiated noise from the river bottom will likely be the dominant source, so highest sound pressures are expected near the bottom. Low frequency sound radiated from the river bottom will not propagate efficiently in the very shallow water because of the long wave lengths of the sound. Keeping the hydrophone a meter away from the bottom minimizes any unusual reflection/absorption phenomena that could cause a non-representative measurement if the hydrophone were to be located closer to the bottom surface.

Temporary Piles

Steel shell piles are planned from south of Bent 5 on land and H-Piles are proposed north of Bent 5 on land and in the water for construction of the temporary trestles and false work. All temporary pile driving in the wetted channel and within 25 meters of the wetted channel will be monitored. For the temporary piles, which are driven in a row and will be driven in a double wall isolation casing, there will be an acoustic monitor in a boat deploying a hydrophone at 10 meters from the pile being driven. Alternatively, the instrumentation could be deployed from the trestle, or from a raft that would be repositioned for each drive. This measurement will then be compared to the project's threshold of 190 dB Peak. In addition to monitoring at 10 meters, there will be three stationary measurement sites approximately 100m from the row of piles being driven. One hydrophone will be located upstream, one hydrophone will be located downstream and one hydrophone will be located across the channel from the bent of piles. A monitor in a boat drifting outward from the source will take additional hydroacoustic measurements. There will be observations of peak noise levels at increasing distances up to at least 100 meters from the source to characterize the noise field and determine locations of maximum noise levels. Measurements from the boat will be made at intermediate distances of 25 m and 50 m from the row of piles in the direction of each stationary measurement site. A measurement from the boat may also be made near the far shore. Additional intermediate or more distant measurement points may be added if warranted from the measurement results.

As stated in the previous section changes to this monitoring process may be necessary to fit site conditions. Underwater sound levels would also be measured any time a change in hammer type or size occurs. Additionally, as described in the "Data Reporting" section of this plan, if underwater sound pressure levels (SPLs) for each pile type and size do not vary to a large degree, then, pursuant to CDFG 2081 Incidental Take Permit Section 4.3.12, Caltrans will provide a written request to the CDFG to discontinue hydroacoustic monitoring. Caltrans will also provide a written request to the Coastal Commission Executive Director to discontinue hydroacoustic monitoring.

Permanent Piles

The permanent piles are 30-inch diameter Cast in Steel Shell piles (CISS) that will be driven in a dewatered cofferdam. All permanent pile driving between Bent 5 and the wetted channel will be monitored. The Permanent piles will be driven in an array consisting of 32 piles in a cofferdam dewatered to below the exterior existing mud line.

There will be up to four hydrophones deployed around the cofferdam. The hydrophones will be located 10m from the center of each side of the cofferdam where the water depth is greater than 1m. These measurements will then be compared to the project's threshold of 190 dB Peak. Measurements at the stationary positions will be conducted with the instrumentation located on small rafts that would be tethered to a buoy or anchored to the bottom. This is a proven method of deploying hydrophones on marine construction projects, utilized on numerous projects previously. There will be one stationary measurement site located 100 meters from the cofferdam. The direction and location will depend upon where the cofferdam is located in the river. For the two piers located near the shore, the stationary location would be located 100 meters normal to the shore towards the center of the estuary. During the driving of the pier located near the middle of the channel, the 100 meter stationary position would be selected based on hydroacoustic monitoring results previously obtained on the project. In addition, there will be a monitor in a boat drifting outward from the source taking hydroacoustic measurements. There will be observations of peak noise levels at increasing distances up to at least 100 meters from the source, to characterize the noise field and determine locations of maximum noise levels. Measurements from the boat will be made at intermediate distances of 25 meters and 50 meters from the cofferdam in directions upstream, downstream, and normal to the cofferdam. Additional drift measurements will be used to determine if there are any isolated areas of higher-than-expected sound pressure in between the defined monitoring distances. As stated in the previous section changes to this monitoring process may be necessary to fit site conditions. Underwater sound levels would also be measured any time a change in hammer type or size occurs. Additionally, as described in the "Data Reporting" section of this plan, if underwater SPLs for each pile type and size do not vary to a large degree, then, pursuant to CDFG 2081 Incidental Take Permit Section 4.3.12, Caltrans will provide a written request to the CDFG to discontinue hydroacoustic monitoring. Caltrans will also provide a written request to the Coastal Commission Executive Director to discontinue hydroacoustic monitoring.

Measurement Equipment

Measurements will be made using G.R.A.S. 10CT hydrophones with PCB in-line charge amplifiers (Model 422E13) and PCB Multi-Gain Signal Conditioners (Model 480M122) or equivalent systems. The signals will be fed into Integrating Sound Level Meters (SLM) and Digital Audio Tape Recorders (DAT) or equivalent equipment.

The peak pressure and root-mean square average sound pressure levels ($RMS_{impulse}$ levels) will be measured "live" using the SLM. The SLM will have the ability to measure the unweighted peak sound pressure and RMS sound pressure levels over the relative short periods (e.g., less than 50 milliseconds). Many SLMs can measure the RMS sound pressure level of these pulses using the standard "impulse exponential-time weighting" (35 millisecond rise time) function. Additional subsequent analyses of the acoustical impulses will be performed using a Real Time Analyzer capable of providing narrow band frequency and corresponding pressure over time analysis (waveform).

Quality Control

The measurement systems will be calibrated prior to use in the field. For example, an acoustical pistonphone and hydrophone coupler could be used to send known sound signals to the underwater sound measurement system. This type of pistonphone used with the hydrophone coupler, produces a continuous 145 dB (re 1 μPa) tone at 250Hz. The SLMs are calibrated to this tone prior to use in the field. The tone is then measured by the SLM and is recorded on to the beginning of the digital audiotapes that will be used. The system calibration status would be checked at the end of the measurement event by both measuring the calibration tone and recording the post-measurement on the tape. The taped calibration tones are used to calibrate the real time analyzer prior to analysis of tape-recorded pulses.

All field notes would be recorded in water-resistant field notebooks. Such notebook entries would include calibration notes, measurement positions, pile-driving information, system gain setting, and equipment used to make each measurement.

Data Reporting

Hydroacoustic data, consisting of Peak levels and RMS levels, will be submitted to the California Department of Fish and Game (CDFG), NOAA Fisheries and the California Coastal Commission staff on a weekly basis. If underwater SPLs for each pile type and size do not vary to a large degree, then, pursuant to CDFG 2081 Incidental Take Permit Section 4.3.12, Caltrans will provide a written request to the CDFG to discontinue hydroacoustic monitoring.

A Final Hydroacoustic Report will be prepared and submitted 30 days following the completion of marine pile driving activities. This report will contain acoustical information (peak, RMS, and SEL) for all piles where measurements were made. Representative frequency spectra and waveform analysis would be provided for each measured pile at a minimum of two different measurement positions. Included with the acoustical information would be the pile identification, distance from the pile, water depth/measurement depth, pile driver size, and other pertinent information. The report would also contain a brief project description, methodology, and presentation of results.

Protective Measures

Caltrans has incorporated all protective measures recommended and required by the permits and approvals by the U.S. Fish and Wildlife Service, NOAA National Marine Fisheries Service, the California Department of Fish and Game, the Regional Water Quality Control Board, the Army Corps of Engineers, and the Negative Declaration.

Based on information provided by the Hydroacoustic Monitor the Construction Liaison or designated individual will have the authority to require the Resident Engineer to immediately stop any activity that is not in compliance with any agency permit or approval, and to order any reasonable measure to avoid the take of an individual of the Covered Species.

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Biological Monitoring Plan

Ten Mile River Bridge Replacement Project

Revised

January 22, 2007

EXHIBIT NO. **1 (Part 2)**

APPLICATION NO.

1-06-022 – CALTRANS

CONDITION COMPLIANCE

BIOLOGICAL MONITORING PLAN (1 of 15)

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Monitoring Plan for Caltrans'

Ten Mile River Bridge Replacement Project

Chapter 1. Introduction

The California Department of Transportation (Caltrans), proposes to replace the Ten Mile River Bridge on State Route 1, at kilometer post [KP] 112 (Mile Post [MP] 69.4) in Mendocino County. The bridge is being replaced because it does not meet current seismic standards (Figure 1). The Ten Mile River Bridge is vulnerable to collapse during a maximum credible earthquake (8.0 on the Richter Scale), and has been included in Phase 2 of the Seismic Retrofit Program. The Ten Mile River Bridge is located approximately 488 meters (1,600 feet) upstream from the Pacific Ocean.

This monitoring plan has been prepared and submitted in compliance with terms and conditions of the National Marine Fisheries Service's (NMFS) Biological Opinion (BO) (No. 151422SWR2004SR8263:GRS) dated June 9, 2006 as well as the agreement Caltrans made to implement a Conservation Recommendation within the NMFS BO. The monitoring plan will also meet obligations for the California Coastal Commission (CCC) permit (1-06-022) as well as the California Department of Fish and Game (DFG) Take Statement (No. 2081-2006-023-03). The monitoring plan describes Caltrans' proposed approach to monitoring for incidental take of listed fish species. First, the plan outlines the methods for monitoring incidental take during fish relocation when the cofferdams are dewatered. (The only incidental take identified by NMFS in their BO is from dewatering associated with the cofferdams and subsequent fish relocation). Second, predation on injured fish by piscivorous birds and marine mammals will be used as a secondary indicator of pile driving effects on listed fish. The primary monitoring for potential effects of pile driving to fish will be the hydroacoustic monitoring (see hydroacoustic monitoring plan. Also an evaluation of the feasibility of the use of duel beam sonar and other methods for fish observations in Ten Mile River is presented in a separate report). Third, Caltrans will monitor water temperature in Ten Mile River near the construction site. Water temperature is thought to limit use of the lower river by salmonids during the warmer portions of the summer months. The implementation of certain elements of the monitoring plan may vary based on changes in construction schedule as well as unforeseen field conditions involving biological and environmental variables. The CCC, NMFS and DFG will be informed of any necessary revisions to the monitoring plan.

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Chapter 2. Project Background

The bridge replacement project is located on State Route 1 in Mendocino County near KP 112 (MP 69.4). The project site is located on the Inglenook USGS 7.5 minute quadrangle, township 20N, Range 17W, Section 33. The bridge is located approximately 488 meters (1,600 feet) upstream from the Pacific Ocean.

The new bridge will be constructed on an alignment approximately 17 meters (56 feet) (centerline to centerline) upstream from the existing bridge. The new bridge will be approximately 451-meters-long (2,480 feet) with two 3.6-meter-wide (12-foot) lanes, and two 1.8-meter-wide (6-foot) shoulders. A 1.5-meter-wide (5-foot) pedestrian walkway and an approximate 0.49-meter-wide (1.6-foot) safety barrier between the walkway and the highway shoulder will be constructed on the west side of the bridge.

The new bridge will have an eight-span superstructure (the bridge deck) supported by three piers (middle supports in the river), four bents (middle supports on land), and two abutments (the end supports). Each of the piers and bents will have two columns, both of which will be supported on approximately 32 0.9-meter (2.5-foot) diameter Cast in Steel Shell (CISS) piles. The construction of the temporary construction trestle and falsework will also require piles. The section of trestle in the river will consist of approximately 90 timber piles or steel H-piles and will extend across the river to the toe of the north bank. The trestle will have several legs extending around the new pier locations. The in-river falsework will be supported by approximately 145 timber or steel H-piles.

Below are some construction details pertaining to pile driving activities such as the construction window and cofferdam installation. A more detailed discussion of the construction of the project can be found in Caltrans, *Biological Assessment. Replacement of Bridge Crossing the Ten Mile River*, dated July 2006.

2.1. Construction Window

Construction for the new bridge is expected to begin in March 2007 with completion anticipated by late 2009. Although the work windows described in this assessment for construction within the river will not change, the year each project item is predicted to begin and end may change due to permitting and contract administration issues.

Although it is proposed to have the construction work within the river completed within two summers of the onset of construction, this plan addresses the potential that work in the river may occur for a maximum of three years to account for potential delays, primarily due to weather or equipment failure.

All in-river temporary piles for the construction of the trestle and falsework will be driven during the in-water work windows (June 15 to October 31 of the first year and between September 15 and October 31 of subsequent years). Hydroacoustic monitoring is required for these piles as well as the temporary piles on land between Bent 5 and the wetted channel and the permanent piles at the three in-river pier locations and on land at Bent 5.

2.2. Cofferdam Construction

Cofferdams will be constructed around pier locations, prior to driving permanent piles in the river. Cofferdams may also be necessary at bent locations on land, if water intrusion is anticipated. The installation of the cofferdams in the river will occur during the same work windows as the trestle and falsework; between June 15 and October 31 of the first year and between September 15 and October 31 of subsequent years. Permanent piles installed within the cofferdams may be driven at any time of the year.

Cofferdams typically consist of 0.6-meter (2-foot) wide sheet piles, driven around the perimeter of the foundation and interlocked together. Cofferdam sheets for this project will be driven with a vibratory hammer. After all of the sheet piles are connected, the resulting cofferdams will be dewatered with a pump and any fish found within the cofferdams will be captured and relocated by a qualified fisheries biologist.

Chapter 3. Purpose of the Monitoring Plan

3.1. Fish Relocation Monitoring

The only anticipated incidental take from the project is associated with cofferdam dewatering and subsequent fish relocation. NMFS estimated that approximately five salmonids would be taken as a result of this activity. The fish relocation monitoring will evaluate the actual take of fish during relocation activities. In order to estimate actual take, the fish relocation biologist will monitor the number of fish relocated and include information on these fish, including their condition.

3.2. Avian and Marine Mammal Predation Monitoring

The predation monitoring plan will provide a redundant means to assess if pile driving at the Ten Mile River Bridge Replacement Project appears to be injuring rearing and migrating juvenile salmonids (the primary monitoring method for noise impacts to fish will be hydroacoustic monitoring). Other than direct observation of fish on the surface of the water, there are no other feasible methods to visually detect distressed, injured or morbid fish during pile driving. Direct observation of fish on the surface by humans monitoring in a boat or on a platform is extremely difficult. Avian and mammalian predators however are attracted to distressed or morbid fish on the water surface. Monitoring for the occurrence of avian or marine mammal predation will be used as a secondary (to hydroacoustic monitoring) means to document fish that are preyed upon at the surface, which may have been distressed, injured, or killed as a result of pile driving.

3.3. Water Temperature Monitoring Plan

The lower reaches of Ten Mile River are thought to be excessively warm in the summer because of lack of cover. Temperature monitoring has not been required by any permitting agency, and the project would not affect water temperature.

Water temperature monitoring will be used to determine if ambient temperature conditions may limit occupation of the lower river by salmonids.

3.4. Relationship to Other Monitoring and Mitigation Efforts

A hydroacoustic monitoring plan and the mitigation site assessment have also been prepared. Hydroacoustic monitoring will occur at various times during temporary and permanent pile driving to characterize the sound fields around temporary and permanent pile driving activities, and monitor for exceedence of the agreed upon underwater sound threshold. This monitoring will record the measurement of peak sound pressures, root mean square ($RMS_{impulse}$)[1] sound pressure levels and sound energy levels (SEL). The measurements will be taken at various distances from the pile driving (See Hydroacoustic Monitoring Plan for details). The avian and

[1] Measured over the representative duration of the pulse.

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marine mammal predation monitoring will be coordinated to the timing of the hydroacoustic monitoring.

Caltrans is proposing to implement compensation for any loss of coho during the Ten Mile River Bridge Replacement Project. The mitigation assessment report evaluates three potential offsite locations for fish passage enhancement and assesses the net gain in rearing habitat that might be expected. The results of the fish relocation, and hydroacoustic monitoring will be used to estimate fish losses from project activities. The avian and marine mammal predation monitoring will be used as a secondary indicator of fish distress or mortality from pile driving activities. To help mitigate possible impacts to coho salmon, a fish passage restoration project will be implemented at Dunn Creek. The mitigation assessment will be used in conjunction with the monitoring results to identify which additional site(s) if any to restore to achieve appropriate compensation for DFG species (coho salmon).

In periods during which the avian and marine mammal predation monitors are not on site, the general project biologist, as part of their duties, will observe and report any flocking of birds to the water surface in the vicinity of pile driving activities to the Resident Engineer.

Chapter 4. Monitoring Program Approach

4.1 Fish Relocation Monitoring

4.1.1. Background

Fish relocation will be monitored to determine the amount of take during cofferdam dewatering. A biological monitor (qualified fish biologist) will be responsible for the rescue and relocation of fish potentially stranded in the dewatered areas. Any coho salmon that die during the relocation efforts will be enumerated and taken into consideration for the mitigation site assessment. In addition to coho salmon, other listed fish, (i.e., tidewater goby, steelhead or Chinook salmon), will be enumerated and reported to the appropriate agency (CDFG, NMFS or U.S. Fish and Wildlife Service).

4.1.2. Methodology

A qualified fisheries biologist familiar with identification of all life stages of fish will continuously monitor the cofferdam dewatering process to ensure that any fish present at the bottom of the cofferdam are captured and safely relocated back to the river. One or more of the following NMFS-approved methods shall be used to capture gobies, salmonids and other fish species: dip net, seine, throw net, minnow trap, hand, electrofishing. The fisheries biologist will note the date and time of collection, the number of fish captured by species, the capture and holding techniques used, the condition of each fish, and when and where the fish were relocated.

If any dead or critically wounded fish are observed, they will be collected and placed in an appropriately sized whirl-pak or zip-lock bag, labeled with the date and time of collection, fork length, and location of capture, and frozen as soon as possible. All collected fish will be kept frozen and held by the fisheries biologist for future analysis (upon request of agencies) of cause of death.

4.1.3. Data Analysis

Data will be provided in tabular format indicating date and time of capture, species and number of fish captured and relocated, relocation area, and general condition of all live fish. In the event of mortality, additional data will include fork length and possible cause of mortality.

4.2. Avian and Marine Mammal Predation Monitoring

4.2.1. Background

In addition to the hydroacoustic monitoring, Caltrans will also implement avian and marine mammal predation monitoring as a redundant means of evaluating potential effects of pile driving in the Ten Mile River estuary. There are limited methods available to determine if fish are being affected by pile driving noise, particularly in an estuarine system like Ten Mile River where water depth is very shallow. Underwater observation of coho behavior by divers would put the divers at risk from construction activities. Other remote methods (such as sonar) are likely not feasible in the Ten Mile River (a feasibility study for use of acoustic survey methods in Ten Mile River is currently being prepared). Underwater cameras would not provide sufficient detail due to vibrations caused by pile driving and water clarity issues. Population and spawning

success would not be appropriate methods to evaluate pile driving effects because of the numerous variables that could affect those attributes.

The conclusion is the most effective and safe method to observe if fish are being affected by underwater sound levels is to monitor for indirect indicators of injury, which is observation of avian and marine mammal predation. Although this method cannot be used to validate "no take", observations will be useful to supplement the results of the other monitoring programs.

4.2.2. Methodology

Observers will be stationed on a small maneuverable vessel to observe birds diving for fish and marine mammal feeding activity. The observers will also monitor the presence of birds and marine mammals and their activities in the area before, during and after pile driving. The predation monitoring team will consist of two members, the biologist and the recorder/timer. The biologist will have the skills to identify piscivorous birds or marine mammals in the Ten Mile River drainage.

The biologist and recorder/timer will be deployed in a skiff to provide mobility within the construction area. The biologist will be equipped with binoculars. The recorder/timer will have a clipboard with data forms and timing devise. The boat will be stationed at multiple locations during a pile driving event, at a safe distance from construction activities, but close enough to observe within a 100-meter (328-foot) perimeter from the pile driving activity.

Predation monitoring shall be performed for 10 days of pile driving in the summer of 2007 and 10 days in 2008. During the spring outmigration period, monitoring will occur for 10 days of pile driving in the spring outmigration season in 2008 and 10 days in 2009. (This results in 40 days of monitoring during the salmon migration periods while pile driving is performed.) However, if pile driving occurs less than 10 days during construction of either season or year, monitoring will only occur during days that pile driving activities occur. If piles are driven in summer 2009 (not anticipated), monitoring will also be conducted during that period.

Prior to the onset of pile driving during each observation season (Summer 2007 and 2008; Spring 2008 and 2009), the monitors will be present on-site for one day to observe bird and marine mammal activity in the Ten Mile River estuary. This will provide a baseline of bird and marine mammal foraging activities during non-pile driving conditions preceding each of the four observation periods. During these pre-pile driving observation days, the monitors will conduct observations throughout the day and identify the location and timing of any observed avian or marine mammal foraging activity in the estuary.

Observations on each of the 40 pile driving observation days will begin before the initiation of pile driving. Prior to pile driving, the biologist and recorder/timer will be stationed downcurrent of the pile to be driven. One observation set is a 15-minute period during which the observation will occur for one minute, each five minutes, over a 15-minute period (one observation set)[2]. The observation team will remain at the down current[3] station, and perform an observation set at the onset of pile driving. Following a 15-minute break as the observation skiff is repositioned,

[2] Any foraging activity observed between sets would also be noted in the observers log
[3] Downstream of the construction site unless tidal currents produce a upchannel current

another observation set will be conducted. This repositioning allows the observation crew to gain a different view of areas (the entire 100-meter (328-foot) perimeter surrounding a pile driving operation could not be observed from one location). This process will be continued through each observation day during periods of active pile driving. (i.e. one observation set before pile driving, then alternating 15 minute observation sets and 15 minute relocation periods throughout the duration of a pile driving event). Following the cessation of the driving of a pile, two additional observation sets (i.e. observe, relocate, observe) will be conducted if daylight allows.

Observations will consist of the biologist noting the numbers and species of birds and marine mammals present in the range of observation, the number and species present within the 100-meter (328-foot) perimeter, if birds or marine mammals are concentrating, foraging or diving within the perimeter, and if prey are being consumed. If prey are visible, the monitor would also attempt to generally identify prey (fish, salmonid). In addition, the observers will also scan the water surface for presence of distressed fish and note any such occurrence. If any moribund fish are opportunistically collected, they will be placed in an appropriately sized whirl-pak or zip-lock bag, labeled with the date and time of collection, fork length, and location of capture, and frozen as soon as possible. All collected fish will be kept frozen and held frozen for one year unless a request is made by NMFS for the specimens.

If predation activities increase and/or concentrate in the observation area during or immediately following a pile driving event, the observers will immediately contact the Resident Engineer or other designated site supervisor at the conclusion of the observation set in which the predation activity was observed (See Chapter 6, Real-time Monitoring and Reporting).

Synchronization of Time Devices

Team members will have their own watches and synchronize them to official sources (i.e., GPS or cell phone) prior to the start of monitoring. Observation times will also be synchronized with the pile driving and hydroacoustic survey logs.

Field Notebooks and Data Forms

Each team member will be provided with a water-resistant field notebook to keep track of daily activities and observations of fish, birds, and marine mammals in the project area. A data form will be developed to record avian and marine mammal predation on fish before, during and after pile driving activities. Data will be transferred from the field notebooks and the data forms to a laptop after daily monitoring is complete.

Data Entry

Team members will be instructed in procedures to enter data and the biologist will monitor the data entry to ensure that the information is entered correctly. The data will be maintained in an Excel spreadsheet. Field note summaries of narrative observations will be entered into a comment field as a "memo data type" linked to the date and other fields as needed.

Quality Assurance

The biologist will review the data entered into the database and check it against the field notes and other sources of information to make sure that the data in the database is accurate and complete.

Data Backup

All the data entered into the master database will be backed up each Friday or at the end of the work week and the backup CD will be stored off-site. The details of data backup will be established early in the project. Emphasis will be placed on making sure that the data is readable and retrievable by authorized Caltrans staff.

Construction Observer Safety Plan

A senior fisheries biologist and/or observers for the fish predation study will prepare a safety plan which will be reviewed with the on-site Caltrans Resident Engineer or Site Supervisor.

4.2.3. Data Analysis

The observations of fish taken by birds and marine mammals during pile driving will be summarized daily. A report will be provided to NMFS, CCC, and DFG weekly as well as within one month after each 10-day sampling period. The reports will detail the results of the predation monitoring. A final report will be provided to the agencies 2 months following the last monitoring period.

4.3. Water Temperature Monitoring

Water temperature monitoring within the Ten Mile estuary is not a permit requirement for this project. The project and related construction activities will have no affect on water temperatures. However, because of perceived high water temperatures during the summer months, Caltrans will monitor water temperatures to determine if water temperatures could be affecting juvenile salmonids ability to rear for extended periods in the estuary. Caltrans feels that the data may be valuable for future projects and would be of interest to the various resource agencies responsible for the management of the Ten Mile River watershed.

4.3.1. Background

Water temperature is an important water quality feature for salmonids. All salmonids need relatively cool water (<15°C) in order to optimize all life history phases. Warm water temperatures cause stress, deterioration in physical condition, and possible impairment in spawning success (McCullough 1999). Listed below in Tables 1 and 2 are water temperatures that begin to have a negative effect (sub-lethal threshold) and cause mortality (lethal threshold) . Water temperatures (sub-lethal and lethal thresholds) are approximate and vary according to acclimated temperatures and different genetic strains of salmonids (Richter and Kolmes 2005).

Adult migration is generally blocked at temperatures above 20°C but can range up to 23°C and also varies according to river system. Mortality can also occur above 20°C. For the parr-smolt transformation to be successful, appropriate water temperatures must be available. Smolt transformation can be reversed if conditions are unsuitable; the fish will revert back to the parr state (Hoar 1988 cited in Myrick and Cech 2001). Temperatures <10°C increase seawater adaptation and consequent survival; temperatures >15°C decrease seawater adaptation (Myrick and Cech 2001).

Table 1. Coho thresholds per life stage

Life Stage	Sub-Lethal Threshold Temperature	Lethal Threshold Temperature
Incubation	12°C	>12°C
Juvenile rearing	17°C	25°C
Adult migration	20°C	>20°C
Smoltification	15°C	n/a

All data taken from [1]Richter and Kolmes 2005

Table 2. Steelhead thresholds per life stage

Life Stage	Sub-Lethal Threshold Temperature	Lethal Threshold
Incubation	10°C[2]	19°C[2]
Juvenile rearing	17°C[1]	28.5°C[2]
Adult migration	20°C[1]	21°C[3]
Smoltification	12°C[3]	n/a

[2]Myrick and Cech 2001
[3]McCullough 1999

4.3.2. Methodology

A total of 3 water temperature loggers will be placed in Ten Mile River in the project vicinity. One logger will be located upstream of the project site near where the river enters the estuary. Two water temperature loggers will be placed at the existing bridge site on the current piers, or on the new bridge (during demolition of existing bridge), if feasible. Logger locations will be photographed and recorded by GPS.

Water temperatures will be monitored continuously using automated water temperature loggers. Temperature loggers will be housed in perforated steel housings, and anchored or tethered in areas of at least 18 inches of water and current to ensure that loggers remain submerged and are not exposed to direct sunlight. In areas where currents are strong or vandalism is a concern, steel cable will be used to connect the housings to woody material anchored to the streambed.

The water temperature loggers will be placed in the water approximately two weeks before construction in the river begins and continue through October of the first year. The loggers will be checked and downloaded every two months during the late spring and early fall, approximately May 15 through October 31, in all construction years.

All temperature loggers will be programmed to record water temperatures at hourly intervals starting at noon on the day of deployment. The deployment date, time, water temperature, and logger number will be recorded in the field.

The loggers will be retrieved every two months to check their status and download recorded data. The logger number, date, time, and water temperature will be recorded in the field notebook. Missing or damaged loggers will be replaced. After the data is downloaded, the loggers will be relaunched.

The fisheries biologist will manage and examine the data to identify any anomalous readings before data reduction. Daily mean, minimum, and maximum temperatures will be calculated from the hourly logger data and organized by station and date.

4.3.3. Data Analysis

All water temperature data will be rectified and stored in an Excel spread sheet. The Excel file will provide an analysis of daily means, hourly means and daily peaks to quantify exceedence of thresholds for the different life stages of coho salmon and steelhead.

Chapter 5. Data Management and Quality Assurance

5.1. Synchronization of Time Devices

The timing devices used in the predation monitoring will be set prior to the start of monitoring in the field by a time source (i.e., GPS or cell phone) that will be used by all observers. They will be rechecked daily before monitoring begins. Time should be the same as the time recorded in the pile driving log and with the hydroacoustic monitoring crew.

5.2. Field Notebooks and Data Forms

Field notebooks and data forms will be used for fish rescue and relocation, the predation monitoring and the water temperature monitoring. All data will be checked by the senior fish biologist to insure accuracy.

5.3. Data Entry

- Instructions for data entry will be reviewed by the senior fish biologist with the data entry person.
- All the entered data will be checked by another person and compared against the data sheets and field notebooks.
- An Excel spreadsheet will be used for the avian predation monitoring and the water temperature data.

5.4. Quality Assurance

- All the entered data will be checked by another person and compared against the data sheets, temperature logger files and field notebooks.

5.5. Data Backup

- All data will be downloaded onto a CD and stored in another location.
- Data will be available to all authorized Caltrans employees.

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Chapter 6. Reports

6.1. Real-Time Monitoring and Reporting Program

If the fish predation monitors observe birds or marine mammals feeding on fish that may have been effected by pile driving, the monitor will immediately notify the Resident Engineer or other designated site supervisor, the monitor shall additionally notify Caltrans' designated District 1 Construction Liaison or the liaison's designated representative of any pile driving related predation incident. In addition, if for any reason the usual Caltrans site supervisor will be unavailable, the Resident Engineer will delegate, to the liaison, the authority to order the immediate cessation of any activity identified by the liaison or the monitor to be non-compliant with the requirements of this project authorization. Caltrans shall ensure that this authority is clearly understood by all parties undertaking any activities on the subject site. The permit does not allow the project activities of concern to re-commence until the state and regulatory agencies with applicable authority have been notified. Remedial action or additional project authorizations that may be necessary to restore compliance with the permit, will be developed by Caltrans with agency concurrence. Such project authorizations must be obtained and the details of such remedial action must be communicated to the liaison, monitor, and the consulting agency or agencies prior to the re-commencement of the project activities of concern.

A weekly biological monitoring report will be prepared summarizing the results of the avian and marine mammal predation study as well as within one month after each 10-day sampling period.

6.2. NMFS, DFG, and CCC Compliance Reports

After each seasonal predation monitoring period, a report will be prepared and submitted to NMFS, DFG, and CCC one month after the monitoring is complete. For monitoring that occurs in the summer of 2007 and 2008, the report will be submitted by October of the monitoring year. Spring monitoring will occur in 2008 and 2009. The reports will be submitted in June of the same year. If three years of monitoring occurs, additional monitoring and reports will be conducted and subsequent reports provided to the agencies.

The water temperature monitoring results will reported approximately one month after the recorders are retrieved in October of each year.

6.3. NMFS, DFG, and CCC Final Report

The final report summarizing all the relocation and monitoring activities will be submitted to NMFS, DFG and the CCC after the final spring monitoring in 2009. The final report will be submitted by August 2009. If additional monitoring is necessary, the final report will be due one month after the final monitoring event.

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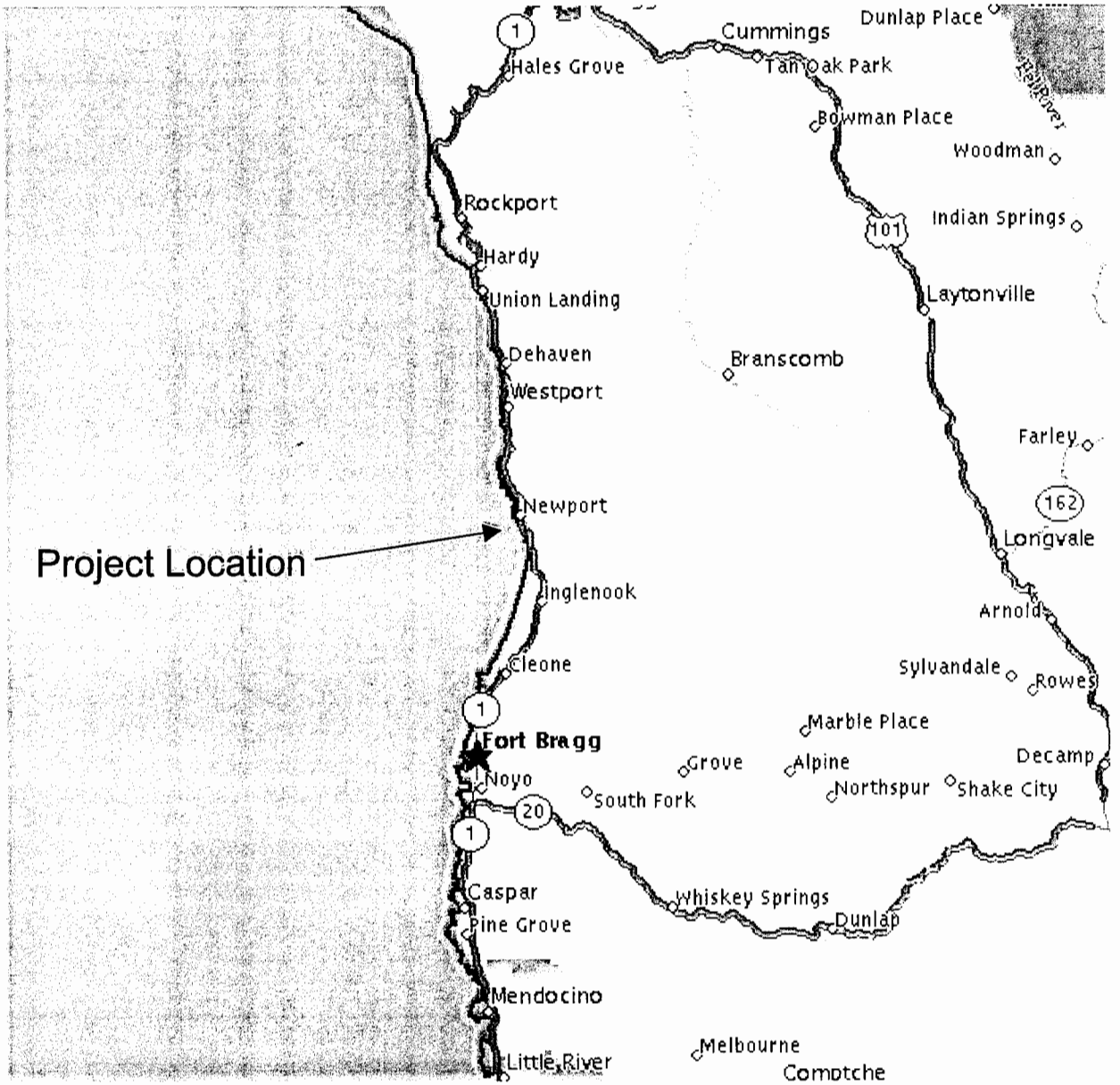

Figure 1. Ten Mile Bridge Site Location

Fish Passage Enhancement/Mitigation Site Assessment and Proposal for the Ten Mile River Bridge Replacement Project

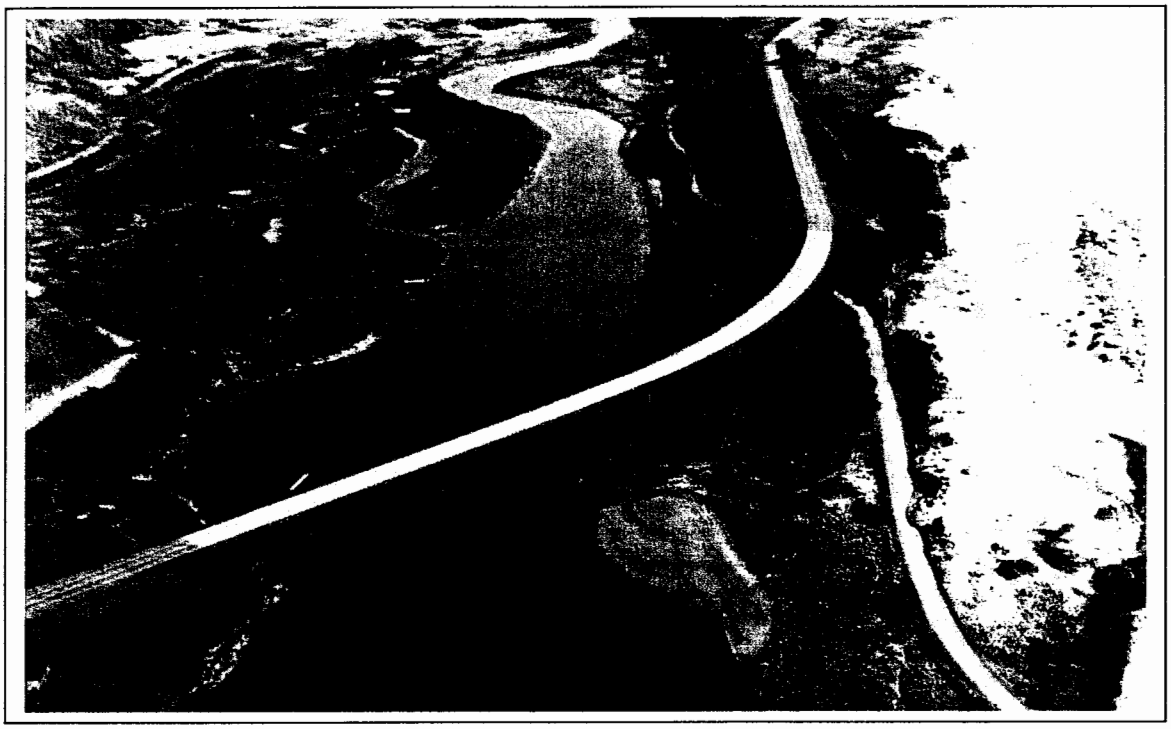

EXHIBIT NO. **2**

APPLICATION NO.

1-06-022 – CALTRANS

CONDITION COMPLIANCE

FISH PASSAGE ENHANCEMENT MITIGATION SITE ASSESSMENT AND PROPOSAL (1 of 15)

September 28, 2006

RECEIVED

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Chapter 1. Introduction

The California Department of Transportation (Caltrans), proposes to replace the Ten Mile River Bridge on Route 1, near mile post (MP) 69.4 in Mendocino County (Figure 1). The bridge is being replaced because it does not meet current seismic standards. The bridge replacement project site is located on the Inglenook USGS 7.5 minute quadrangle, township 20N, Range 17W, Section 33. The bridge is located approximately 488 meters (1,600 feet) from the Pacific Ocean.

This Fish Enhancement/Mitigation Site Assessment and Proposal has been prepared to evaluate potential mitigation sites that would compensate for the take of coho salmon juveniles that may occur as the result of the Ten Mile Bridge Replacement project activities.

The new bridge will be constructed on an alignment approximately 17 meters (56 feet) (centerline to centerline) upstream from the existing bridge. The new bridge will be approximately 451-meters-long (2,480 feet) with two 3.6-meter-wide (12-foot) lanes, and two 1.8-meter-wide (6-foot) shoulders. A 1.5-meter-wide (5-foot) pedestrian walkway and an approximate 0.5-meter-wide (1.6-foot) safety barrier between the walkway and the highway shoulder will be constructed on the west side of the bridge.

The new bridge will have an eight-span superstructure (bridge deck) supported by three piers (middle supports in the river), four bents (middle supports on land), and two abutments (the end supports). Each of the piers and bents will have two columns, each of which will be supported on approximately 32 0.76-meter (2.5-foot) diameter Cast in Steel Shell (CISS) piles.

National Marine Fisheries Service's (NMFS) Biological Opinion (BO) concluded that the only lethal take would be as a result of mortality associated with fish relocation from constructed cofferdams. Three cofferdams will be installed in the river for permanent pile placement, and will be dewatered during construction. It is anticipated that most Chinook, coho, and steelhead will exit the cofferdam prior to closure. However, NMFS estimated that less than 160 juvenile salmonids could remain in the cofferdams after closure, and that mortality could occur in up to 3% of those fish during relocation. Thus, it is anticipated that take of up to 5 juvenile salmonids could occur as the result of the project. These 5 juvenile salmonids could be coho or Chinook salmon, or steelhead, but we will assume all are coho for California Endangered Species Act (CESA) consultation purposes. However, monitoring of this activity will occur to determine the exact extent of take that occurs during cofferdam construction and dewatering (please refer to Caltrans Fisheries Biological Monitoring plan for details). Because of work windows built into the project construction schedule, only juvenile salmonids will be present during cofferdam dewatering.

Caltrans has also prepared a monitoring plan for pile driving activities to assess for potential take associated with actual construction activity. Caltrans' intent is that the mitigation site(s) will compensate fully for take as determined through CESA and confirmed through monitoring, and will provide additional conservation benefits to listed salmonid populations in the project area. The primary objective of this mitigation site assessment is to evaluate three fish passage restoration sites to determine the levels of benefit each mitigation/stewardship project would

provide to local fish populations in these drainages. Per the California Department of Fish and Game (DFG), these benefits would fully mitigate any unanticipated impacts associated with the actual project construction, and provide additional conservation benefits. The analysis will also look at the benefits of each site as compared to the costs associated with removal of each site's confining barrier in order to provide a cost-benefit analysis for each site. Caltrans will then be able to select a site(s) based on each site's ability to meet the primary mitigation objective and provide the most benefit to fish populations for the cost.

The fish passage project(s) would be initiated after project completion. In consultation with CDFG, an evaluation of the hydroacoustic effects will be conducted to determine the required level of compensation. Currently one fish passage site is proposed. If the impacts identified during construction are greater than the compensation achieved (additional rearing habitat) by the first mitigation site to be implemented, then additional fish passage sites commensurate with the level of additional impact would be implemented.

As discussed above, this plan was developed for the potential hydroacoustic effects on coho salmon juveniles. The NOAA/NMFS Biological Opinion determined that the employed avoidance and minimization measures would fully mitigate for the potential effects on steelhead and Chinook from pile driving, and that the only take might occur during dewatering of the cofferdams (estimated that up to 5 juvenile salmon could be taken). The USFWS Biological Opinion also made the determination that avoidance and minimization measures for hydroacoustic impacts would be protective of tidewater goby. Although this plan was developed for CDFG and their concerns over coho take, the evaluated fish passage sites are also expected to benefit steelhead and Chinook. Regarding the tidewater goby, a mitigation plan specifically addressing the goby has not been prepared. The goby, though, uses eelgrass as habitat. There is an eelgrass plan that addresses eelgrass mitigation and monitoring, which identifies a net result in eelgrass/goby habitat after project completion

The following sections will thoroughly discuss the context and setting of each site, including data from independent evaluations of each site, and a synopsis of the benefits and costs associated with each site. The final site selection will occur in consultation with DFG after project monitoring and reporting has confirmed the actual extent of take of coho salmon associated with the Ten Mile River Bridge Replacement project.

Chapter 2. Site Characterization and Assessment

From 2000 through 2004, Dr. Margaret Lang of Humboldt State University (HSU), conducted an independent assessment of fish passage barriers associated with Caltrans facilities. Along the north coast of California, Dr. Lang's assessment considered all observed barriers, with special consideration of barriers that partially or completely excluded salmon from stream habitats with a gradient of less than 8% that could be categorized as potential habitat for juvenile salmonids. The assessment defined the status and characteristics of each barrier, while also assessing the amount and quality of habitat available upstream of each barrier.

The assessment was based on the data collection methodology from the DFG Salmonid Stream Restoration Manual Part IX (DFG 2003). As the surveyors did not have access rights to completely survey the upstream channel, all determinations of habitat quantity and quality were made either from observations at the crossing site and/or by reviewing previous DFG surveys, aerial photographs, and topographic maps (Lang 2006). Habitat quantity and quality are numerically ranked based on the following methodology from the DFG Salmonid Stream Restoration Manual Part IX:

- **Habitat Quantity** - Above each crossing, length in feet to a sustained 8% gradient or field identified limit of anadromy. In Dr. Lang's study, this metric was derived from 1:24k topographic maps. Habitat quantity is scored as 0.5 points for each 500 feet of stream between the identified barrier and the 8% slope break (example: 0.5 points for <500 feet; 1 point for 1,000 feet; 2 points for 2,000 feet; and 5.5 points for 5,500 feet). The maximum possible score for Habitat Quantity is 10.

- **Habitat Quality** – For each stream, assign a score of quality after reviewing available habitat information. Consultation with local DFG biologists to assist in assigning habitat quality score is recommended. Habitat quality is scored as follows:

    1. ***1.0*** = *Excellent* - Relatively undeveloped, with pristine watershed conditions. Habitat features include dense riparian zones with mix of mature native species, frequent pools, high-quality spawning areas, cool summer water temperatures, complex instream habitat, floodplain relatively intact.

    2. ***0.75*** = *Good* - Habitat is mostly intact but erosional processes or other factors have altered the watershed with a likelihood of continued occurrence. Habitat includes dense riparian zones of native species, frequent pools, spawning gravels, cool summer water temperatures, complex instream habitat, floodplain relatively intact.

    3. ***0.5*** = *Fair* - Erosional processes or other factors have altered the watershed with negative affects on watershed processes and features, with the likelihood of continued occurrence. Indicators include:

        a) riparian zone lacking mature conifers

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b) infrequent pools

c) sedimentation evident in spawning areas (embeddedness ratings of 3)

d) summer water temperatures periodically exceed stressful levels for salmonids

e) sparse instream complex habitat, and floodplain intact or slightly modified.

4. ***0.25*** = *Poor* - Erosional processes or other factors have significantly altered the watershed. There is a high likelihood of increased erosion and apparent effects to watershed processes. Habitat impacts include riparian zones absent or severely degraded, little or no pool habitat, excessive sedimentation evident in spawning areas (embeddedness ratings of 4), stressful to lethal summer water temperatures common, lack of instream habitat, floodplain severely modified with levees, riprap, and/or residential or commercial development.

As per Part IX of the Salmonid Stream Restoration Manual, these two metrics (Habitat Quantity and Habitat Quality) are multiplied in order to derive a single metric for theoretical habitat value. This value can be used to rank the potential benefits of proposed actions to remove fish passage barriers by quantifying the relative amount and quality of habitat that will become accessible as the result of removal of barriers.

Additionally, Caltrans consulted with Scott Harris, a fisheries biologist with DFG, in order to get another professional assessment of the quality of each site and get input from DFG on the potential of barrier removal/fish passage restoration at each site to benefit the target species.

The three potential fish passage restoration sites on State Route 1 in Mendocino County that Caltrans is considering are Dunn Creek at MP 92.83, an unnamed tributary to Cottoneva Creek at MP 89.20, and an unnamed tributary to Cottoneva Creek at MP 88.71. All three streams were selected for analysis due to the presence of a defined barrier under Caltrans ownership and the presence, or presumed presence, of the target species from knowledge shared by Scott Harris, DFG. All three sites are discussed in detail in the following sections.

2.1. MP 92.83—Dunn Creek

This stream crossing is on Dunn Creek, a primary tributary of the North Fork of Cottoneva Creek that crosses State Route 1 at MP 92.83 in Mendocino County, roughly four miles north of Rockport, California (Figure 2). The barrier is a 108-inch-diameter structural steel plate culvert embedded in a concrete road prism that fills the active channel width of 9.9 feet and is buried about a foot into the channel substrate. The culvert is 92 feet in length with a 3% maximum gradient over the length of the culvert. There are 3 weirs between the outlet and the natural tailwater control. There is an elevation difference of 3.4 feet between the first and second weirs. All three weirs are heavily degraded and in the process of failing. The barrier was calculated to

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be passable 0% of the time for juvenile stages and 24% of the time for adult anadromous salmonid life history stages.

Dr. Lang's survey determined that 1,200 feet of habitat for anadromous salmonids exists upstream of the barrier (between the barrier and the 8% slope break). The quality of the site was roughly determined to be good as the culvert does not appear to significantly degrade channel morphology and has a good variety of substrate classes with relatively clean cobbles and gravels.

A 1995 CDFG survey electro-fished 3 sites on Dunn Creek and found juvenile steelhead up to 5,682 feet upstream from the confluence with the North Fork of Cottoneva Creek (DFG 1995). A 1999 DFG site report noted juvenile coho were present below the State Route 1 culvert. Dr. Lang's survey noted several unidentified fish (<3") were observed downstream of the State Route 1 culvert during the site survey on 19 June 2002.

Caltrans has also completed a cost estimate for the fish passage restoration on Dunn Creek (MP 92.83) as itemized in Table 1. The anticipated cost of the project is $410,000 based on 2006 cost estimates.

Table 1: Cost analysis and scope of work for fish passage restoration at Dunn Creek (MP 92.83)

Line Item		Cost
Remove Gabion Weirs		$30,000
Structure Excavation		$19,000
Fish Weir (includes concrete and reinforcing steel) 4 of them		$110,000
rock lined jump pools engineered substrate) for 30 meters		$101,000
construct access road		$20,000
erosion control		$5,000
Revegetation		$5,000
traffic control		$7,500
Stormwater		$5,000
Subtotal		$302,500
	35% contingency	$105,875
Total		$408,375
CALL		**$410,000**

2.2. MP 89.20—Unnamed Tributary to Cottoneva Creek

This stream crossing is a minor tributary of Cottoneva Creek that crosses State Route 1 at MP 89.20 in Mendocino County, roughly a mile to the north of Rockport, California (Figure 2). The barrier is a 78-inch-wide and 46-inch-high structural steel plate oval culvert embedded in a concrete road prism that fills the active channel width of 6 feet. The culvert is 65 feet in length with a 6.2% maximum gradient over the length of the culvert. There is a roughly one-foot drop from the culvert outlet, but there is a large deep pool at the outlet. Dr. Lang's study found the culvert to be a barrier due to water depth and water velocity. The barrier was calculated to be passable 0% of the time for both juvenile and adult salmonid life history stages.

Dr. Lang's survey determined that 200 feet of habitat for anadromous salmonids exists upstream of the barrier (between the barrier and the 8% slope break). The quality of the site was roughly

determined to be fair as the result of simplified habitat complexity and localized erosion that are symptomatic of the presence of the culvert and subsequent influence on stream velocities and geomorphology upstream of the barrier.

No DFG surveys are available for the tributary, but the presence of steelhead is presumed due to the species presence in the mainstem of Cottoneva Creek. Dr. Lang noted dense canopy cover both upstream and downstream of the crossing, which appeared to be made up of an overstory of evergreen firs and a fern understory. No fish were observed at the site at the time of the survey. Scott Harris was not familiar with the crossing and thus did not provide input, but based on Mr. Harris' comments regarding the unnamed tributary of Cottoneva Creek at MP 88.71, it can be presumed that the unnamed tributary to Cottaneva Creek at MP 89.20 does get periodic use by coho in good water years, as do many of the small, unnamed tributaries throughout the Mendocino County coast.

Caltrans has also completed a cost estimate for the fish passage restoration at the unnamed tributary to Cottaneva Creek (MP 89.20) as itemized in Table 2. The anticipated cost of the project is $510,000 based on 2006 cost estimates.

Table 2: Cost analysis and scope of work for fish passage restoration at the un-named tributary to Cottaneva Creek (MP 89.20)

Line Item		Cost
remove culvert		$5,000
remove headwall		$3,000
precast concrete box (8 x 6), 65 ft		$175,000
Headwall		$7,000
grade control at inlet/outlet (jump pools)		$100,000
Revegetation		$3,000
erosion control		$3,000
traffic control		$75,000
Subtotal		$371,000
	35% contingency	$129,850
Total		**$500,850**
CALL		**$510,000**

2.3. MP 88.71—Unnamed tributary to Cottoneva Creek

This stream crossing is a minor tributary of Cottoneva Creek that crosses Highway 1 at MP 88.71 in Mendocino County, less than a mile to the north of Rockport, California (Figure 2). The barrier is a 54-inch structural steel plate (smooth bore) culvert embedded in a concrete road prism that fills the active channel width of 8.6 feet. The culvert is 51 feet in length with a 2% maximum gradient over the length of the culvert. There is a two-foot drop from the culvert outlet with no jump pool below the outlet. Dr. Lang's Study found the culvert to be a barrier due to leap height, water depth, and water velocity. The barrier was calculated to be passable 0% of the time for both juvenile and adult salmonid life history stages.

Dr. Lang's survey determined that 1,200 feet of habitat (between the culvert and the 8% slope break) for anadromous salmonids exists upstream of the barrier. The quality of the site was

roughly determined to be fair as the result of simplified habitat complexity and localized erosion that are symptomatic of the presence of the culvert and subsequent influence on stream velocities and geomorphology upstream of the barrier.

No DFG surveys are available for the tributary, but the presence of steelhead is presumed due to the species presence in the mainstem of Cottoneva Creek. Dr. Lang's survey crew noted that the stream has good canopy cover both upstream and downstream of the crossing, which appears to be made up of an overstory of evergreen firs and a fern understory. No fish were observed at the site at the time of the survey. Scott Harris notes that because of its location, low in the Cottoneva Creek system, and based on behaviors observed, that the unnamed tributary to Cottaneva Creek at MP 88.71 does get periodic use by coho, although not necessarily every year, depending on the hydrograph of the water year. This is based on the knowledge that coho, in good water years, use many of the small, unnamed tributaries throughout the Mendocino County coast.

Caltrans has also completed a cost estimate for the fish passage restoration at the un-named tributary to Cottaneva Creek (MP 88.71) as itemized in Table 1. The anticipated cost of the project is $350,000 based on 2006 cost estimates.

Table 3: Cost analysis and scope of work for fish passage restoration at the un-named tributary to Cottaneva Creek (MP 88.71)

Line Item		Cost
remove culvert		$5,000
remove headwall, wingwall		$5,000
precast concrete box (8 x 6), 52 ft		$150,000
headwall		$7,000
wingwall		$7,000
revegetation		$3,000
erosion control		$3,000
traffic control		$75,000
Subtotal		$255,000
	35% contingency	$89,250
Total		**$344,250**
CALL		**$350,000**

Chapter 3. Synopsis and Conclusions

All of the sites were selected because they support or have the potential to support listed fish species. This analysis assesses if these sites could provide compensation for any take of coho salmon (and also benefit Chinook salmon and steelhead) that could occur as a result of the Ten Mile Bridge Replacement project. The amount of compensation each site can provide as a result of restoration will be a principal consideration when the final site selection is made. The habitat value of each stream, and thus the streams ability to compensate for take, is derived from the quantity of habitat and quality of that habitat, as calculated from the metrics collected by Dr. Lang as per Part IX of the DFG Salmonid Stream Restoration Manual.

A summary of the metrics of each site is shown in Table 4. The most basic conclusion is that the replacement of the culvert on Dunn Creek would provide the greatest habitat value in terms of habitat quantity and quality. The unnamed tributary to Cottoneva Creek at MP 88.71 would provide the same quantity of new habitat as at Dunn Creek, but is of lower quality. Finally, the unnamed tributary to Cottoneva Creek at MP 89.20 would provide significantly less new habitat, but is of similar quality to that of the unnamed tributary to Cottoneva Creek at MP 88.71. Based simply on quantity and quality of habitat that could be made accessible by correcting the respective barriers, Dunn Creek and the unnamed tributary to Cottoneva Creek at MP 88.71 would clearly provide the greater habitat gain for listed species (i.e. coho and steelhead) as well as additional conservation benefits in comparison to the unnamed tributary to Cottoneva Creek at MP 89.20.

Table 4: Summary of Habitat Metrics

Site	Habitat Quantity (feet)	Habitat Quality	Habitat Value
Dunn Creek (92.83)	1,200	0.75	900
Un-named tributary to Cottaneva Creek (89.20)	200	0.5	100
Un-named tributary to Cottaneva Creek (88.71)	1,200	0.5	600

Additionally, the costs of removing each barrier and restoring fish passage were considered in this analysis in order to determine the cost in comparison to the relative habitat value gained. Thus, the estimated cost of each fish passage restoration was assessed per the cost of each habitat value point achieved under each fish passage restoration scenario as shown in Table 5. As the barrier at the unnamed tributary to Cottoneva Creek at MP 89.20 would provide significantly less new habitat and was the most expensive barrier to remove, the cost per habitat value point was roughly 10 times the cost of the removal of the barriers at Dunn Creek and the unnamed tributary to Cottoneva Creek at MP 88.71. Both the barriers at Dunn Creek and the unnamed tributary to Cottoneva Creek at MP 88.71 were relatively the same in terms of cost per habitat value point, with Dunn Creek providing slightly greater habitat quality in comparison to the cost of removing the barriers at the unnamed tributary to Cottoneva Creek at MP 88.71.

Table 5: Summary of Cost Analysis of Fish Passage Restoration Sites

Site	Habitat Value	Cost of Barrier Removal	Cost per Habitat Value Point
Dunn Creek (92.83)	900	$410,000	$456
Un-named tributary to Cottaneva Creek (89.20)	100	$510,000	$5,100
Un-named tributary to Cottaneva Creek (88.71)	600	$350,000	$584

As NMFS' estimates show that less than 160 juvenile salmonids could remain in the cofferdam after closure, it was presumed that mortality could occur in up to 3% of that population during relocation. Thus, it is anticipated that take of up to 5 juvenile salmonids, including Chinook, coho, and steelhead could occur as the result of the project. As discussed under each site, both coho and steelhead are presumed to be present at each of the fish passage restoration sites proposed, although coho may only be present in good water years.

In order to confirm that areas of habitat proposed to be made accessible will definitively compensate for take, we looked for an appropriate corollary in order to determine the potential productivity of these habitat areas for juvenile salmonids (which are the target species subject to take). Connors (1996) determined densities of juvenile salmonids using north California coast streams as part of a Doctoral thesis at the University of California at Davis and found, in general, densities of 0.0226 fish/ft^2 during winter rearing and 0.0122 fish/ft^2 during summer rearing in northern California coastal streams. Table 6 roughly calculates the amount of habitat that each barrier removal/fish passage restoration will make accessible by multiplying the length of newly accessible habitat by the active channel width measured at the barrier. This results in a rough calculation of the habitat available for summer and winter rearing and the potential productivity of those habitats.

Table 6: Summary of Potential Habitat Productivity

Site	Habitat Length (feet)	Active Channel Width (feet)	Total Habitat Area (ft^2)	Rearing Density [A]	Estimated Productivity [B]
Dunn Creek (92.83)	1,200	9.9	11,880	Winter: 0.0266 Summer: 0.0122	Winter: 316 Summer: 145
Un-named tributary to Cottaneva Creek (89.20)	200	6.0	1,200	Winter: 0.0266 Summer: 0.0122	Winter: 34 Summer: 15
Un-named tributary to Cottaneva Creek (88.71)	1,200	8.6	10,320	Winter: 0.0266 Summer: 0.0122	Winter: 275 Summer: 126

A – From Connors 1996
B – In numbers of fish potentially supported

Given the results presented in Table 6, all of the potential fish passage restoration sites evaluated would make habitat available for enough juveniles to more than compensate for the take of the 5 juvenile salmonids that are anticipated to be lost, as the result of take that may occur during fish relocation operations in conjunction with the Ten Mile River Bridge Project.

The overall conclusion of this report, and Caltrans' intent, are that the proposed fish passage restoration sites at either Dunn Creek or the unnamed tributary to Cottoneva Creek at MP 88.71 are the preferred sites to compensate for take that may occur as the result of the Ten Mile Bridge Replacement Project. Caltrans will coordinate with DFG before selection of the final site. The overall conclusion of this report, and Caltrans' intent, are that the proposed fish passage restoration sites at either Dunn Creek or the unnamed tributary to Cottoneva Creek at MP 88.71 are the preferred sites to compensate for take that may occur as the result of the Ten Mile Bridge Replacement Project. Caltrans will coordinate with DFG before selection of the final site. The success of the fish passage restoration site(s) will be based on the passability of the as-built culverts.

Appropriate environmental studies, authorization and permits will be required before any work can be undertaken at the final site(s).

Chapter 4. References

California Department of Fish and Game (DFG). 1995. Unpublished stream surveys. DFG, Yountville, CA.

California Fish and Game Department (DFG). 2003. Fish Passage Evaluation At Stream Crossings. Part IX of The Salmonid Stream Restoration Manual. http://www.dfg.ca.gov/nafwb/manual.html

Connors, E. J. 1996. Comparative evaluation of Pacific giant salamander and steelhead trout populations among streams in old-growth and second-growth forests of northwest California. Ph. D. dissertation. University of California, Davis.

Lang, M. M. 2006. Personal Communication. E-mail sent on August 8, 2006.

Lang, M. M., M. Love, and B. Trush. "Monitoring Fish Passage at Culverts on Coastal Streams." American Fisheries Society-California/Nevada Division Annual Meeting. March 30 - April 1, 2000. Ventura, California.

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Figures

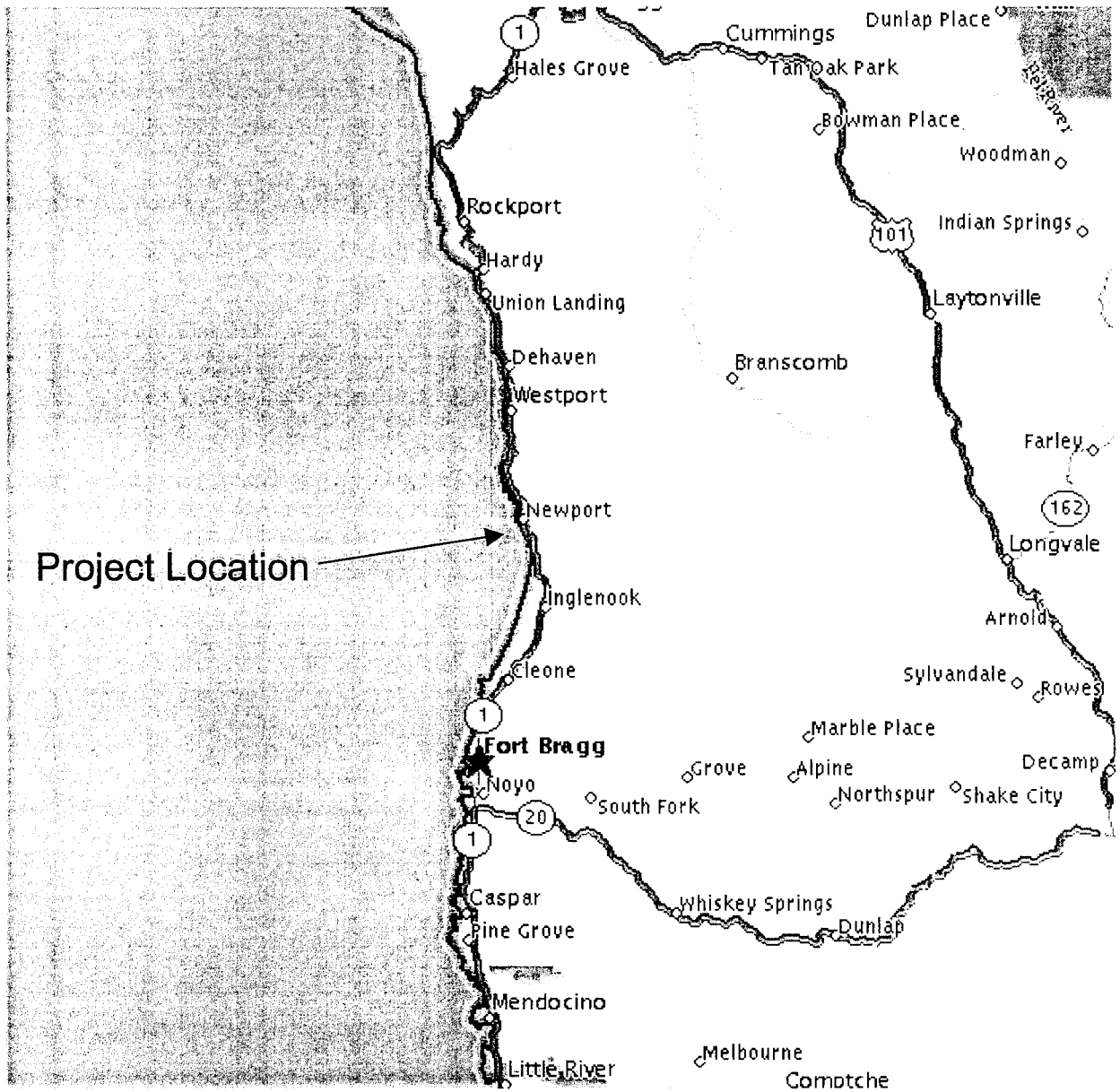

Figure 1. Ten Mile Bridge Site Location

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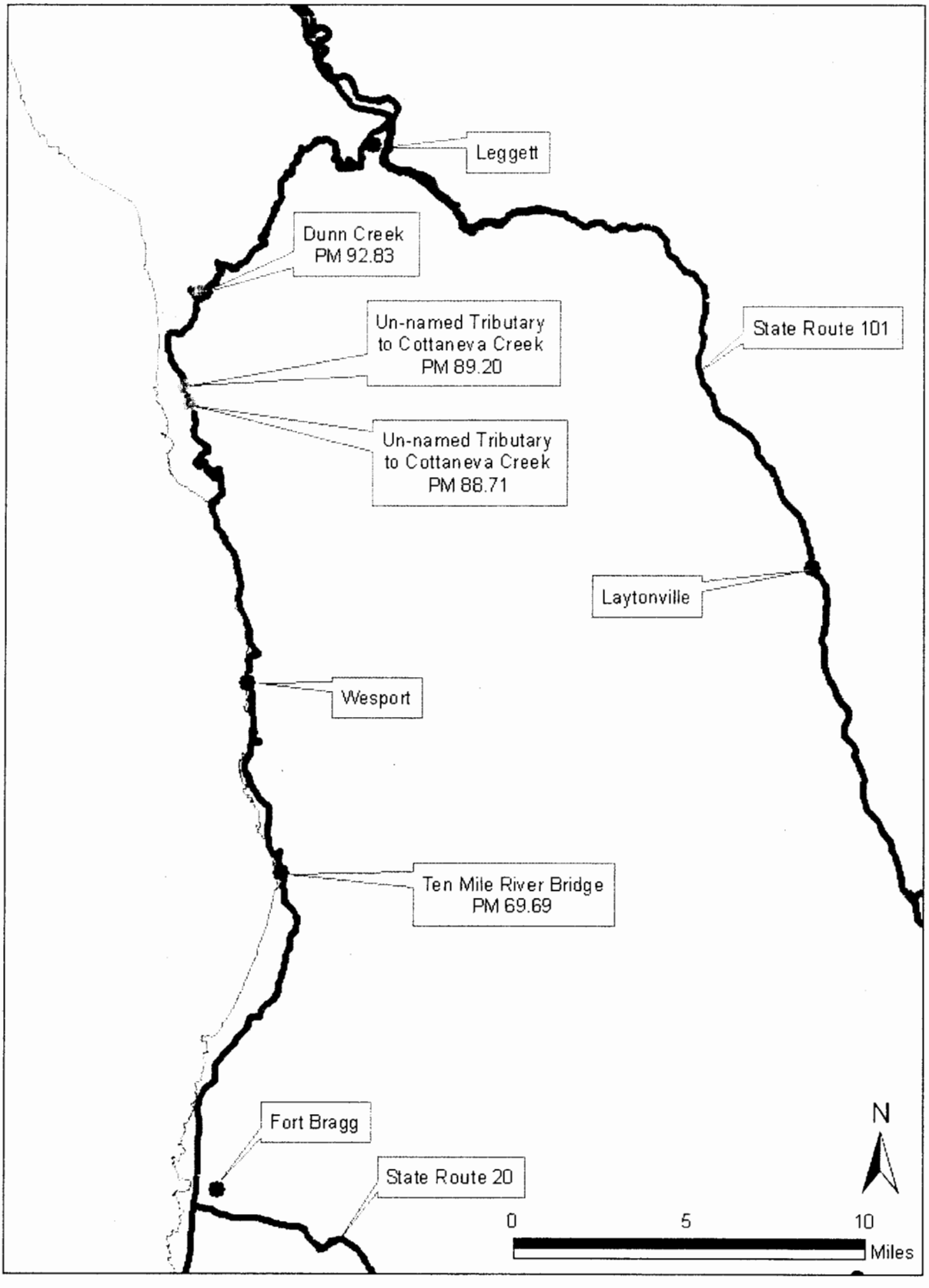

Figure 2. Mitigation Sites

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Marine Mammal Monitoring Plan for the Ten Mile River Bridge Replacement Project

EXHIBIT NO. 3
APPLICATION NO.
1-06-022 – CALTRANS
CONDITION COMPLIANCE
MARINE MAMMAL
MONITORING PLAN (1 of 6)

March 3, 2006

Revised September 29, 2006

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Project Description

Caltrans proposes to replace the existing bridge over the Ten Mile River in Mendocino County. The bridge crosses the river approximately 1,600 feet upstream of the river's mouth. Attached is a copy of the Construction Scenario for the project. The scenario provides the construction methodologies that will be utilized during construction of the new bridge as well as the demolition of the existing bridge.

Although both species are infrequent visitors to the river, harbor seals (*Phoca vitulina*) and California sea lion (*Zalophus californianus*) are known to occur in the estuary. Because of potential noise-related dangers to marine mammals during construction, the following monitoring plan has been developed.

Potential Project Related Effects

Pacific harbor seals and California sea lions are protected under the Marine Mammal Protection Act, under which it is illegal to "take" a marine mammal without prior authorization from NOAA Fisheries. Take is defined as harassing, hunting, capturing, killing, or attempting to harass, hunt, capture, or kill any marine mammal. Harassment is defined as any act of pursuit, torment, or annoyance that has the potential to injure a marine mammal in the wild, or has the potential to disturb a marine mammal in the wild by causing disruption of behavioral patterns, including but not limited to migration, breathing, nursing, breeding, feeding, or sheltering.

Based on information from similar projects involving pile driving and on a review of published literature, NOAA Fisheries has determined that impulsive hammering sounds can have a detrimental effect on marine mammals by causing stress, interfering with communications and predator/prey detection, and changing behavior. Impulse sound pressure levels of 160 dB have been shown to cause behavioral changes. More significantly, acoustic overexposure to such loud sounds can lead to temporary or permanent loss of hearing. NOAA Fisheries is in the process of determining safety criteria for marine species exposed to underwater sound, including impulsive sound.

Pile Driving. For construction work in the river itself, the project will use attenuated H piles for all temporary trestle and falsework piles. The attached Hydroacoustic Report indicates that for attenuated H piles, the peak noise levels would range between 176-189 dB at 10 meters from the source with corresponding root mean square (RMS) values ranging between 156-174 dB.

As indicated in the Hydroacoustic Report, noise levels for the permanent piles driven inside cofferdams dewatered to the existing mudline could reach a peak level of 190 dB at 10 meters from the source with a corresponding RMS range of 177 to 179 dB.

Even though not commonly observed in the project area, pile driving activities have the potential to harass harbor seals and sea lions that may be swimming and/or foraging in the project vicinity. Any short term impacts, while fairly negligible, may result in a temporary reduction in utilization of the estuary while work is in progress or until animals acclimate to the disturbance. However, it is presumed that individuals will likely avoid the project area once construction in the river begins, thus avoiding direct injury. Since the Ten Mile estuary is used only intermittently for foraging and does not provide haul-out areas, pile driving should not have any substantial effect on any individuals. The utilization of a monitor during pile driving further reduces the opportunities for any individual seal or sea lion to be anything other than annoyed during pile driving.

Other Potential Effects. Due to the low probability of marine mammals being present during construction and the fact that turbidity will be closely monitored, any increase in turbidity should have minimal effect, if any, on harbor seals or sea lions.

Removal of the temporary piles used during the construction of the new bridge and the removal of the old bridge may occur year-round. The piles will be vibrated out. There may be some minor vibration directly adjacent to the piles and increased turbidity. Both are expected to be localized and short in duration.

Monitoring Plan

It is the intention of this monitoring plan to ensure the safety of marine mammals by not exposing them to dangerous levels of underwater noise; however, it is also in the best interest of these animals for the project to be completed as quickly as possible to avoid prolonging these dangers. A balance must be struck between protecting the animals and avoiding unnecessary construction delays. This plan assumes a provision of adaptive management that achieves the best balance possible between, on the one hand, allowing timely completion of construction so that the exposure to dangerous noise levels is not prolonged, and on the other hand, avoiding the exposure of animals in the Ten Mile River estuary to dangerous noise levels. Adaptive alteration to this plan will be based on the expert assessment of the marine mammal monitor during initial observations of how pinnipeds react/respond

to pile driving, and important alterations will be approved by NOAA Fisheries. All changes will be carefully documented.

In addition to protecting marine mammals from harassment, it is also the intention of this monitoring effort to collect data that will be useful in helping NOAA Fisheries to further understand the effects of certain types of construction noise and activity on marine mammals.

A biologist shall be present during pile driving of both temporary piles (trestle and falsework) and permanent piles to observe for marine mammals in the vicinity of the pile driving activity. To avoid harassment, as defined above, a preliminary safety zone of 500 feet will be established around the pile-driving sites based on data that marine mammals have shown behavioral changes when exposed to impulse sound pressure levels as low as 160 dB. Noise levels will be monitored during pile driving of both temporary and permanent piles installed in the river (see the attached Hydroacoustic Report). After each set of noise measurements is completed, the size of the safety zone will be increased or decreased and may change with the type of noise being generated.

Responsibilities of the monitor during construction are to ensure that marine mammals are not exposed to excessive noise levels from pile-driving activities. Pile driving will not be initiated if marine mammals are present within the safety zone. Either the monitor or Caltrans staff (on the days when the monitor is not present) will scan the safety zone upstream and downstream of the bridge for 5 to 10 minutes continuously at the beginning of each day just prior to pile driving to determine whether marine mammals are present.

Pile driving will not begin until the safety zone is clear. If a marine mammal later swims into the safety zone during pile driving, pile driving will continue. Prior to initiating driving of any pile with the full energy of the hammer, the contractor will conduct a "dry start" which consists of the pile being tapped with the hammer several times.

The monitor will then scan the area for the next 30 seconds to 1 minute to determine if an animal is still in the area or if one has moved closer to the work area. If pile driving stops for one minute or more, the monitor will conduct another scan of the area. The monitor will focus on the safety zone but include upstream and downstream areas in the sweep as well. The scan will involve two visual "sweeps" of the area using the naked eye and binoculars, if necessary. Typically, the sweep would be conducted slowly as follows: one sweep going from left to right and the other returning from right to left (or however the monitor wants to do it). The length of time it takes to

do the sweep will depends on the amount of area that needs to be covered, weather conditions, other visual impairments (for example, glare on the water) and how long it takes the monitor to thoroughly survey the area.

The monitor will notify the Caltrans Resident Engineer of the results of each required scan and any observation of marine mammal entry into the safety zone. Caltrans staff will then notify the contractor whether and when to start or stop pile driving. A log of dates, times, and results of the 5-minute scans will be kept.

The monitor shall record the date, time, location, distance, direction of travel, species, abundance, approximate age class, and behavior of the marine mammal sighted. All monitoring data collected during construction will be made available to NOAA Fisheries.

An attempt will be made to answer the following questions:

- How do marine mammals respond to the onset of pile driving?
- How far away from the noise do animals seem to be affected?
- Are certain behaviors associated with distance from the disturbance, i.e., are they more likely to exhibit one behavior when they are near the noise and another when they are farther away?
- If they leave the area during pile driving, how long does it take them to return after pile driving stops? Is it within 45 minutes?
- Are they ever observed swimming into or near the outer edges of the safety zone during pile driving?
- What is the distance at which retreat behavior is observed?
- Does there appear to be any habituation? Do animals seem to be less disturbed later in the season than initially?
- Do these animals appear to be reacting/responding more to pile driving than to other types of construction-related activities? Are they startled by any other particular noises? What types of noises?
- Do changes to the monitoring plan seem to be affecting what is observed in these animals?

Caltrans has incorporated all protective measures recommended and required by the permits and approvals by the U.S. Fish and Wildlife Service, NOAA National Marine Fisheries Service, the California Department of Fish and Game, the Regional Water Quality Control Board, and the Army Corps of Engineers.

Based on information provided by the designated Marine Mammal Monitor, the Construction Liaison will have the authority to require the Resident

Engineer to immediately stop any activity that is not in compliance with any agency permit or approval, and to order any reasonable measure to avoid the take of an individual of the Covered Species.

Monthly summary reports will be submitted to NOAA Fisheries. A final report summarizing the construction monitoring and any general trends observed will be submitted within 30 days after monitoring has ended.

References

Caltrans. 2002. Application for an Incidental Harassment Authorization – Humboldt Bay Bridges Seismic Retrofit.

Caltrans. 1997. Richmond-San Rafael Bridge Seismic Retrofit Project - National Marine Fisheries Service Application for an Incidental Harassment Authorization.

North State Resources, Inc., in association with Ibis Environmental Services, Inc. December 2002. Noyo River Bridge Replacement Project Marine Mammal Monitoring Report. Prepared for California Department of Transportation-Region 3.

Bird & Bat Nesting/Roosting Plan for the Ten Mile River Bridge Replacement Project

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COASTAL COMMISSION

September 29, 2006

EXHIBIT NO. **4**
APPLICATION NO.
1-06-022 – CALTRANS
CONDITION COMPLIANCE
BIRD & BAT NESTING/
ROOSTING PLAN (1 of 13)

The California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA) are proposing to replace the bridge over the Ten Mile River on Route 1, post mile 69.4 in Mendocino County. The project is part of Caltrans' Statewide Seismic Safety Program. The purpose of the project is to provide an earthquake-resistant and scour-resistant bridge by replacing the existing bridge with a new one.

The new bridge will be constructed on an alignment approximately 16 meters (52 feet) (centerline to centerline) upstream from the existing bridge. This new structure will provide the same habitat quality, quantity and type currently being used by bird and bat species. These features include: box girders, bent caps and surrounding riparian vegetation.

Current Bird Use

A cliff swallow colony, with pairs numbering in the hundreds, can be found nesting on the existing bridge between March through the end of August. This colony is the largest in Mendocino County and among the largest in Northern California (Mendocino Coast Audubon Society, 2004).

In addition to the cliff swallow, the existing bridge itself provides nesting habitat for purple martins, which have been documented nesting in the drainage holes of the bridge (Dorothy Tobkins pers. comm.). Corvids have been observed making nests in the bent caps of the existing bridge. Numerous songbird species have been observed nesting in the riparian vegetation surrounding the existing bridge.

Surveys

Any necessary clearing will take place prior to February 1st of each construction season. If clearing in the 100 year floodplain is proposed or needs to occur during the nesting season (February 1 to July 31), nest surveys shall be conducted.

Pre- and post- construction surveys will be conducted to assess the habitat usage of birds on both the existing and new structures and surrounding vegetation. These surveys will be conducted by a qualified biologist.

Avoidance and Minimization Measures

In order to minimize impacts, removal of the existing bridge superstructure, falsework and temporary trestles will be limited to August 1- February 1 of any year, which is outside of the nesting period.

Current Bat Use

There are a small number of bats currently using the existing Ten Mile River Bridge as an occasional night roost. The new bridge will have features that will be usable by bats in the same capacity. During the period of construction, bats will still be able to use the existing structure.

Surveys to date (see survey memos attached) have positively ruled out use of the bridge as a day roost and/or a maternity roost. These surveys indicate that because of the type of

nighttime roosting only, no additional avoidance, minimization and mitigation will need to be developed in order for bats to have continued habitat use in the same capacity as is currently provided at the existing structure.

Surveys
No additional bat surveys are needed at the existing or new bridge locations.

Avoidance and Minimization Measures
Bats will be able to continue to use the existing structure as an occasional nighttime roost during the construction period.

The new bridge will have the same habitat value as the existing bridge.

Plan Implementation

Caltrans has incorporated all protective measures recommended and required by the permits and approvals by the U.S. Fish and Wildlife Service, NOAA National Marine Fisheries Service, the California Department of Fish and Game, the Regional Water Quality Control Board, and the Army Corps of Engineers.

A qualified biologist will conduct the needed surveys, as detailed above. If there are any observations that the biologist has during these surveys that require an adjustment of work methods, they will notify the Resident Engineer, Construction Liaison or designated Caltrans site supervisor.

The Construction Liaison will have the authority to require the Resident Engineer to immediately stop any activity that is not in compliance with any agency permit or approval, and to order any reasonable measure to avoid the take of an individual of the Covered Species.

References
Replacement of the Bridge Crossing the Ten Mile River Natural Environment Study: Discussions of Biological Assessments, Wetland Studies, Mitigation Plan, Monitoring Plan, November 27, 2005.

Attachments
Bat Survey, June 12-13, 2006
Bat Survey, July 24, 2006

State of California
Business, Transportation, and Housing Agency

Memorandum

To: File
Steve Croteau
Lisa Embree

Date: June 21, 2006

File: 01-MEN-1
EA 385700
Ten Mile River Bridge

From: DEPARTMENT OF TRANSPORTATION – NORTH REGION
Office of Environmental Management E-2, Eureka

Subject: SUMMARY OF BAT SURVEY AT TEN MILE RIVER BRIDGE

The following is the summary of a survey of bat habitat and use of the Ten Mile River Bridge in Mendocino County. The bridge was surveyed from 8 PM until midnight on June 12, 2006 by Coady Reynolds and Jo Braden (Jo Braden is on the approved Caltrans/California Department of Fish and Game Bat Memorandum of Understanding list of authorized individuals under principal investigator Gregg Erickson). An additional daytime visit was made on June 13, 2006 to verify some of the information collected during the previous night survey. Survey techniques employed were visual habitat assessment, bridge feature assessment, emergence count and observation, and guano inspection. No netting, trapping or acoustic surveys were done as part of this survey.

The emergence count showed a total of eight bats, with no more than two individuals observed at the same time. These individuals were all observed between 8:45 PM and 10:15 PM. During the daytime follow-up survey, small guano piles near the open girder sections at the abutments of the bridge were found.

The observed use of the bridge (both emergence count and guano inspection/location) is consistent with night roosting, and it is possible that the observed bats stopped over there in the daytime as well. However, the bridge is not likely a daytime or maternity roost, as no large emergence was seen from the bridge, nor were large guano piles found. Additionally, the thermodynamic properties of a the existing bridge, given its proximity to the ocean, are such that temperatures are below what is needed for maternity

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and daytime roost habitat. It is also not likely a hibernaculae, based on the exposed location and proximity to disturbance.

The bat species observed (through visual inspection and guano analysis) is likely Big Brown Bat *(Eptesicus fuscus)*. Additional survey techniques (laboratory guano analysis, use of acoustic survey equipment, etc.) would be needed to positively identify species of bat. Big Brown Bats weigh approximately 14-21 grams, with a wingspan of 32-40 centimeters. Their distribution is from southern Canada through to South America. These bats are closely associated with humans and have summer roosts in attics, barns, bridges and other man-made structures. Maternity colonies number to several hundred individuals. This species is common throughout most of its range (Bats of the United States, Harvey, M., Atlenbach, J. S, and Best, T.L.).

There is the potential to temporarily impact bats using the existing Ten Mile River Bridge as an occasional night roost. However, the new bridge will have features that will be usable by bats in the same capacity (specifically open girders). During the period of construction, bats may still be able to use the existing structure, as no nighttime work is planned.

An additional survey will be conducted to positively rule out use of the bridge as a day roost and/or a maternity roost. The additional planned survey, along with a potential pre-construction survey, will ensure that habitat use of the bridge is consistent with the determination of current habitat use. If these surveys show differing habitat use, additional avoidance, minimization and mitigation will be developed in conjunction with the appropriate agencies.

If there are any additional questions regarding this survey and associated memo, please contact me at (707) 441-5844 or at jo_braden@dot.ca.gov.

JO BRADEN
Associate Environmental Planner
Natural Sciences
Office of Environmental Management

State of California
Business, Transportation, and Housing Agency

Memorandum

To: File
Steve Croteau
Lisa Embree

Date: September 11, 2006

File: 01-MEN-1
EA 385700
Ten Mile River Bridge

From: DEPARTMENT OF TRANSPORTATION – NORTH REGION
Office of Environmental Management E-2, Eureka

Subject: SUMMARY OF FINAL BAT SURVEY AT TEN MILE RIVER BRIDGE

The following is the summary of a follow-up survey of bat habitat and use of the Ten Mile River Bridge in Mendocino County. This second bridge survey took place on July 24, 2006 at approximately 13:00 and was conducted by Jo Braden (Jo Braden is on the approved Caltrans/California Department of Fish and Game Bat Memorandum of Understanding list of authorized individuals under principal investigator Gregg Erickson). Survey techniques employed a visual survey of the inside of the box girders (both North and South ends of the bridge) using a high-powered flashlight and guano inspection. No netting, trapping or acoustic surveys were done as part of this survey.

Both of the two box girder sections of the bridge were opened at the manhole access points along the bridge deck. Maintenance personnel (Jeff Bowser in charge) opened the manholes and also provided one-way controlled traffic for safety purposes. Additionally, standard precautions for confined spaces inspection were employed. Jo Braden was the only person who was inside of the box girders during the survey.

Total survey time lasted approximately 90 minutes, with the time being equally divided between the two box girders. Survey technique was to access all chambers of each of the box girders and to visually inspect all crevices, corners, expansion joints, weepholes and other areas that bats might be utilizing as habitat within the box girders. The high-powered flashlight (and it's backup) were utilized to have a clear visual inspection. Additionally, pictures were taken within the structure.

No bats were found within the structure. Some small piles of guano, indicative of one to less than 10 individuals occasionally using the structure as a night roost, were found and inspected. Preliminary inspection suggests that the species using the bridge is likely Big Brown Bat *(Eptesicus fuscus)*.

Big Brown Bats weigh approximately 14-21 grams, with a wingspan of 32-40 centimeters. Their distribution is from southern Canada through to South America. These bats are closely associated with humans and have summer roosts in attics, barns, bridges and other man-made structures. Maternity colonies number to several hundred individuals. This species is common throughout most of its range (Bats of the United States, Harvey, M., Atlenbach, J. S, and Best, T.L.).

One swallow was found within the structure. There was no associated nest found, and the individual had likely flown in by chance.

The observed use of the bridge (both emergence count and guano inspection/location from the previous survey on June 12, 2006 and this survey) is consistent with night roosting. The bridge is not a daytime or maternity roost, as no large emergence was seen from the bridge, nor were large guano piles found, and no colony of bats was found within the structure during the daytime. Additionally, the thermodynamic properties of a the existing bridge, given its proximity to the ocean, are such that temperatures are below what is needed for maternity and daytime roost habitat. It is also not a hibernaculae, based on the exposed location and proximity to disturbance.

There is the potential to temporarily impact bats using the existing Ten Mile River Bridge as an occasional night roost. However, the new bridge will have features that will be usable by bats in the same capacity (specifically open girders and box girders). During the period of construction, bats will still be able to use the existing structure, as no nighttime work is planned.

This additional survey has positively ruled out use of the bridge as a day roost and/or a maternity roost. These surveys indicate that because of the type of nighttime roosting only, no additional avoidance, minimization and mitigation will need to be developed in order for bats to have continued habitat use in the same capacity as is currently provided at the existing structure.

If there are any additional questions regarding this survey and associated memo, please contact me at (707) 441-5844 or at jo_braden@dot.ca.gov.

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JO BRADEN
Associate Environmental Planner
Natural Sciences
Office of Environmental Management

8 of 13

State of California
Department of Transportation

Business, Transportation and Housing Agency

Memorandum

To: File

Date: December 4, 2006

File No.: 01-MEN-1
PM 69.2/70.1
01-38570
Ten Mile River Bridge

From: Jo Braden
Environmental Management Branch E-2, Eureka

Subject: Response to questions on Ten Mile Bird & Bat Nesting/Roosting Plan (dated September 29, 2006)

This memo serves to clarify questions raised by the California Coastal Commission staff regarding the Ten Mile Bird & Bat Nesting/Roosting Plan. The original text of the aforementioned plan has not been altered from the original version, dated September 29, 2006, hereafter referred to as "the plan" in this memo.

Bat use on existing vs. new bridge

Bat habitat usage on the existing bridge is shown in Figures 1 & 2 below. The bat population is small, as evidenced by the emergence count and guano piles, as well as lack of finding a large population physically within the structure during the daytime. This small population of bats shows usage consistent with occasional night roosting within the box girders and at the bridge abutments. If there were a daytime roost or a maternity roost, there would be large (several inches tall at least) piles of guano either within the bridge structure and/or underneath the bridge at the abutments.

A description of the surveys to address bat habitat usage can be found in the plan on pages 4 through 8. The first survey, which took place on June 12 & 13, 2006, was of the exterior of the bridge structure at nighttime. The follow-up survey on July 24, 2006 was a daytime survey within the interior of the box girders of the bridge. Figure 1 illustrates evidence of night roosting bat usage within the box girders.

In addition to these two surveys, both conducted in accordance with the California Department of Fish & Game/ Caltrans MOU on which I am listed as an authorized individual, the field maintenance supervisor, Jeff Bowser, was interviewed. In the 12 years that he has been working on and inside the Ten Mile River Bridge, he has not encountered a permanent

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(daytime or maternity) bat roost. Jeff has worked on and in many bridges over the years, and has had informal training by the President of Bat Conservation International, Dr. Merlin D. Tuttle. With Jeff's experience and informal training, I am confident in his ability to assess whether bats have used the Ten Mile River Bridge as a permanent roost.

The proposed new bridge structure will have these same features that will be able to be utilized as habitat by bats. In summary, these bridge features are bridge abutments and interior of box girders, which they gain access to via drainage holes.

Bird habitat on existing vs. new bridge

Bird habitat usage on the existing bridge is shown on Figures 3, 4, & 5 below. The main bird population is the cliff swallow colony, described on page 2 of the plan, which utilizes bridge features such as bent caps and the sides of the bridge girders, as illustrated in Figures 4 & 5. Other bird species that use the bridge are corvids (shown with nest on bent cap in Figure 4), songbirds that use the surrounding riparian vegetation shown by example in Figure 5, and purple martins that occasionally utilize the interior of the box girder structure (guano shown in Figure 3).

The proposed new bridge structure will have these same features that will be able to be utilized as habitat by these species. In summary, these bridge features are bent caps, sides of bridge girders, surrounding riparian vegetation and interior of box girders.

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Figure 1) Evidence of bat guano inside of box girder of existing Ten Mile River Bridge

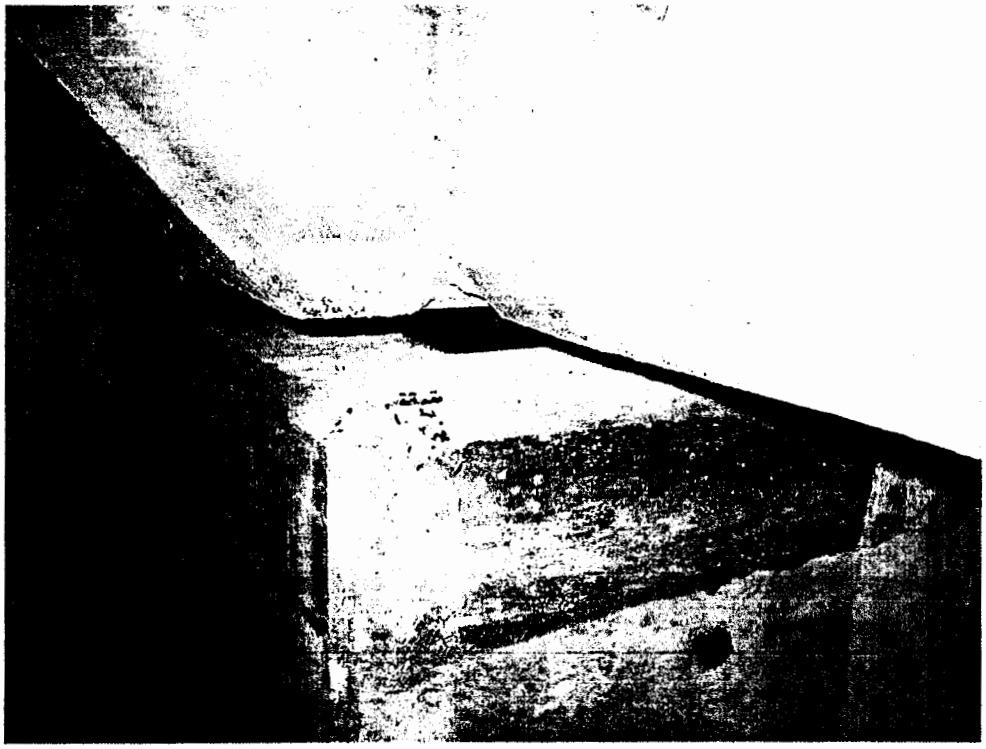

Figure 2) Evidence of bat guano at bridge abutment

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Figure 3) Evidence of bird guano inside of box girder of existing Ten Mile River Bridge

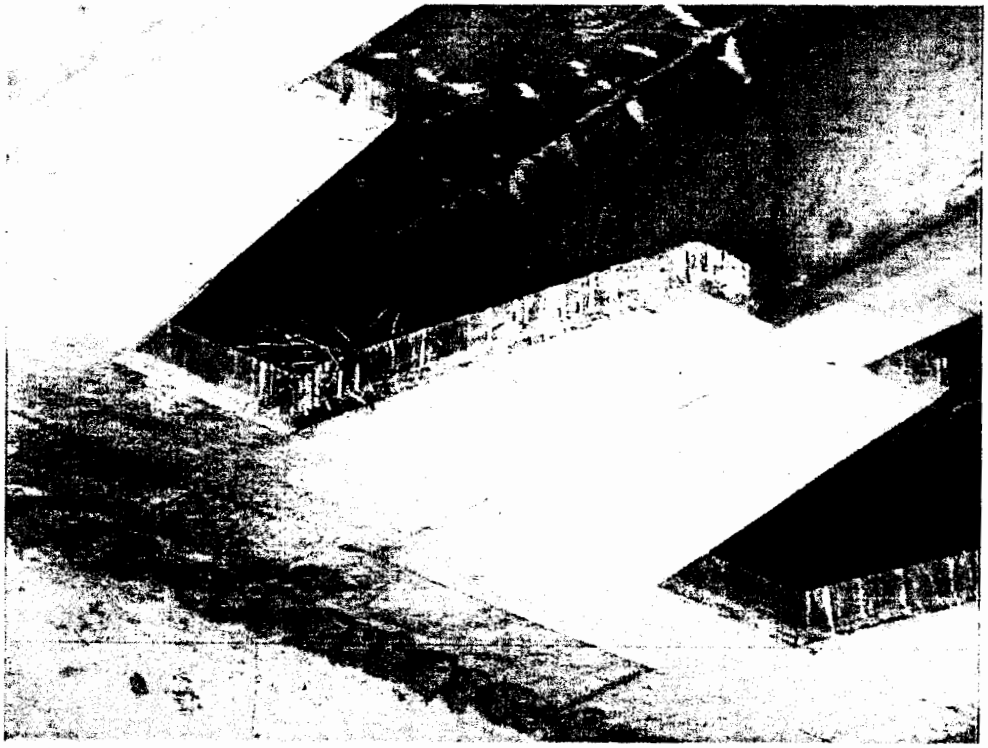

Figure 4) Swallow and corvid nests on existing Ten Mile River Bridge

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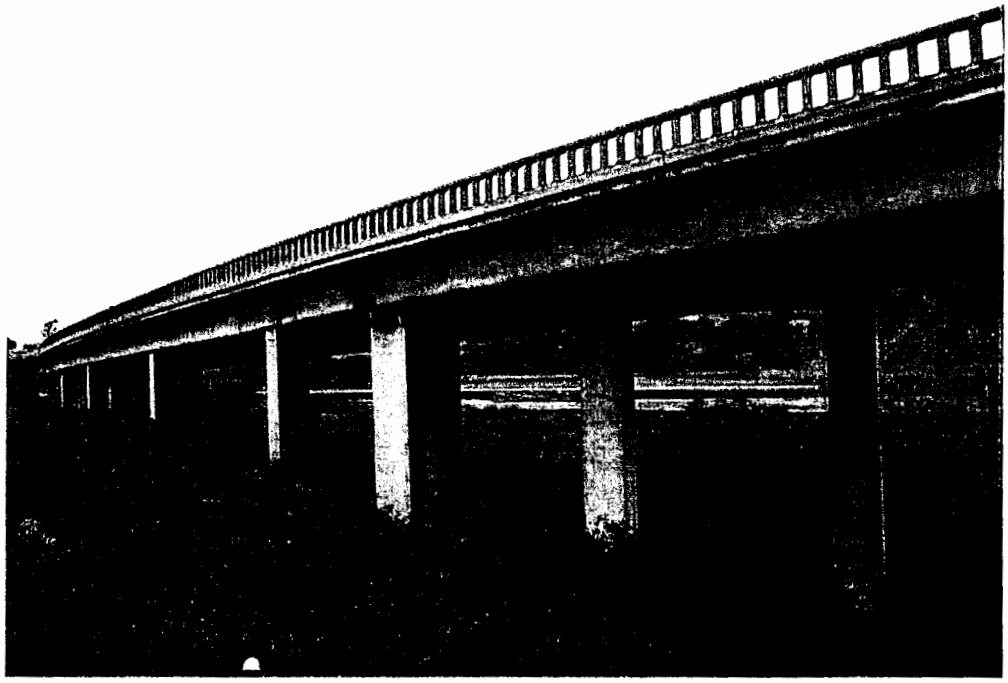

Figure 5) Swallow nests on existing Ten Mile River Bridge

cc: S. Croteau
L. Embree

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State of California
DEPARTMENT OF TRANSPORTATION

Business, Transportation and Housing Agency

Memorandum

Flex your power!
Be energy efficient!

To: Ms. Melanie Faust, Senior Program Analyst
North Coast District
California Coastal Commission
P.O. Box 4908
Eureka, CA 95502-4908

Date: January 24, 2006

File: MEN-1-PM 69.4/70.1
01-385701
Ten Mile River Bridge

RECEIVED
JAN 24 2007
CALIFORNIA
COASTAL COMMISSION

From: Alan Escarda, Project Manager
Caltrans District 1

Signature on File

Subject: Ten Mile River Bridge Project—Prior to Commencement and In-Water Work Submittals

The Coastal Development Permit (CDP 1-06-022) and Public Works Plan (PWP 1-06-01) for the Ten Mile River Bridge Seismic Replacement Project requires Caltrans, prior to construction, to submit several plans for review and approval of the Executive Director. On January 24, 2007, for the purposes of brushing the California Coastal Commission (CCC) informed Caltrans that all prior to commencement documentation (see list below) have been approved. Prior to any other construction activities, Caltrans will submit a Contractor prepared SWPPP for the review and approval of the Executive Director.

For clarification, the fish passage enhancement project located at Dunn Creek (SR 1, Post Mile 92.83) and referenced in the (Fish Passage Enhancement/Mitigation Site and Proposal) will act as a conservation measure (pursuant to CDP 1-06-022, Special Condition 2). Monitoring reports containing the decibel levels measured in the field during pile driving will be submitted to the Coastal Commission, NOAA Fisheries, CDFG, and USFWS as required in the permits and authorizations of the respective agencies. If the decibel levels exceed 190 dB (decibel) peak at 10 meters from the pile being installed, Caltrans will confer with the agencies to determine whether the increased decibel levels are significant and/or warrant remedial action. Caltrans hereby confirms that for the purpose of continuing compliance with Special Condition 2 of CDP 1-06-022, if the Executive Director, after consultation with NOAA Fisheries, CDFG, USFWS, and Caltrans biologists, determines that the exceedance of the 190 decibel level (at 10 meters) limit is of biological significance, additional mitigation may be required pursuant to the requirements of CDP 1-06-022.

Caltrans additionally confirms that the final plans submitted in compliance with Special Conditions 1, 2, 4, and 27 must be approved by the Coastal Commission prior to commencement of any in-water work. Commission review of these compliance plans is scheduled for February 2007.

Steven Croteau of my staff is available to answer any questions (441-5615).

EXHIBIT NO. 5
APPLICATION NO.
1-06-022 – CALTRANS
CONDITION COMPLIANCE
MEMORANDUM FROM
CALTRANS (1 of 2)

Prior To Commencement Submitted Plans

CDP SC# 8:	Erosion Control Plan (January 22, 2007)
CDP SC# 8:	Revegetation Plan (January 23, 2007)
CDP SC# 9:	Drainage Structure Plan (December 5, 2006)
CDP SC# 12:	Brushing Mini SWPPP (December 19, 2007)
CDP SC# 19:	Final Signage Plan (January 2, 2007)
CDP SC# 23:	Final plans with ADA trail and walkway (January 2, 2007)
PWP SC# 17:	Demolition, Staging, and Storage Plan (January 18, 2007)
PWP SC# 19:	Disposal Plan (December 28, 2006)
PWP SC# 24:	Biological Monitoring Plan (December 29, 2006)
PWP SC# 24:	Water Quality Monitoring Plan (January 23, 2007)

Prior To In-Water Work Submitted Plans

CDP SC# 1:	Hydroacoustic Monitoring Plan (January 22, 2007)
CDP SC# 1:	Biological Monitoring Plan: Avian Predation (January 22, 2007)
CDP SC# 2:	Fish Passage Enhancement Plan (September 28, 2006)
CDP SC# 4:	Marine Mammal Monitoring Plan (March 3, 2006)

Required Within 1 Year of Permit

CDP SC#: 27	Bird and Bat Nesting and Roosting Plan (September 29, 2006)

Attachments Legend
CDP SC# = Coastal Development Permit Special Condition Number
PWP SC# = Public Works Plan Special Condition Number

CALIFORNIA COASTAL COMMISSION
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SAN FRANCISCO, CA 94105-2219
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MEMO

EXHIBIT NO. 6
APPLICATION NO.
1-06-022 – CALTRANS
CONDITION COMPLIANCE
MEMORANDUM FROM MARK DELAPLAINE DATED JANUARY 24, 2007 (1 of 10)

DATE: **January 24, 2007**

TO: **Melanie Faust, John Dixon, Bob Merrill**

FROM: **Mark Delaplaine**

RE: **Caltrans 10 Mile River Bridge, CDP 1-06-022 (and related consistency certifications, public works plans) condition compliance (acoustic issues)**

The Commission's permit conditions adopted on June 16, 2006, included requirements that Caltrans submit, for Commission review, revised monitoring and mitigation plans, including:

(1) a final fish injury and acoustic monitoring plan;

(2) a final marine mammal monitoring plan; and

(3) avian and other predator monitoring plans.

The conditions also required Caltrans to commit to providing ongoing monitoring reports to the Commission staff, as well as to coordinate, and to submit for Commission staff review and approval, any future changes to the monitoring protocols.

The Commission's conditions and findings specified that the fish injury and acoustic monitoring include the following:

> *The plan shall include a description of how the acoustic footprint will be determined, what equipment/personnel efforts to observe or detect fish reactions to pile driving are proposed, the length of time and number of sound measurement replicates that will be consecutively collected to adequately characterize the sound footprint and maximum hydroacoustic impact generated by project activities, how Caltrans proposes to adequately monitor hydroacoustic affects on fish if visibility is impaired (such as by weather, available light, or turbidity), what criteria will be used for fish injury thresholds, and how such criteria, and fish injury, will be measured. The acoustic footprint monitoring shall provide adequate data point locations (including several hydrophone locations between the proposed 10 meter and 100 meter locations) sufficient to adequately characterize the acoustic footprint. In addition, if sonar*

> *monitoring of fish behavior during pile-driving is required by state and/or federal agencies, the method and equipment used to conduct such monitoring, and the means of describing and reporting the results shall be included in the Acoustic Monitoring Plan;*
> ...

The Commission's conditions and findings specified that the marine mammal monitoring plan include:

> *the requirement that construction may not commence in the event of reduced visibility (i.e., the observer must be able to see the required distance, or pile driving may not commence until visibility has improved and the observer can verify that the area is clear of marine mammals). Caltrans shall submit a copy of the revised plan to the Executive Director prior to commencement of in-water construction activities.*

Since the Commission's decision, Caltrans has revised and updated its monitoring plans and commitments and met with the Commission and other agency staffs to discuss the revisions. Based on the most recent of these meetings, Caltrans has submitted a revised Hydroacoustic Monitoring Plan for the Ten Mile River Bridge Replacement Project, dated January 19, 2006 (copy attached), which contains modifications Caltrans has agreed to incorporate based on the discussions with the Commission and other agency staffs, including detailing how and where the monitors will take measurements of the pile driving sounds and how they will characterize the acoustic footprint from the pile driving. The hydroacoustic monitoring will be supplemented by monitoring unusual predation, as discussed in Caltrans' "Fish Relocation, Avian and Marine Predation, and Water Temperature Monitoring Plans for the Ten Mile River Bridge Replacement Project," (dated September 28, 2006), and by the Marine Mammal Monitoring Plan (dated March 3, 2006). These latter two plans are supplemented by additional commitments and clarifications contained in Caltrans' December 8, 2006, Memo entitled "Response to the California Coastal Commission memo of 10-25-06" (copy attached).

Among other measures, the revised Hydroacoustic Monitoring Plan specifies that:

1) monitors will take fixed measurements at 10 and 100 meters (m);

2) where feasible, monitors will take measurements closer than 10 m;

3) using a boat monitors will take various other (i.e., drifting) measurements, including attempting to locate the loudest noise levels, and including at least measurements at 25 m and 50 m (and using accurate GPS data to identify all distances); and

4) Caltrans will submit for Commission staff review and approval any changes to the monitoring, including but not limited to any request to discontinue or reduce levels of acoustic monitoring once Caltrans believes it has adequately characterized the sound footprint.

The plan also reiterates:

a) that all feasible physical measures have been incorporated that would reduce sound levels;

b) the goal is that sound levels will not exceed 190 dB at 10 meters;

c) that Caltrans will measure sound exposure levels (SELs), in addition to instantaneous peak and RMS sound pressure levels;

The plan includes the following discussion:

There will be up to four hydrophones deployed around the cofferdam. The hydrophones will be located 10m from the center of each side of the cofferdam where the water depth is greater than 1m. These measurements will then be compared to the project's threshold of 190 dB Peak. Measurements at the stationary positions will be conducted with the instrumentation located on small rafts that would be tethered to a buoy or anchored to the bottom. This is a proven method of deploying hydrophones on marine construction projects, utilized on numerous projects previously. There will be one stationary measurement site located 100 meters from the cofferdam. The direction and location will depend upon where the cofferdam is located in the river. For the two piers located near the shore, the stationary location would be located 100 meters normal to the shore towards the center of the estuary. During the driving of the pier located near the middle of the channel, the 100 meter stationary position would be selected based on hydroacoustic monitoring results previously obtained on the project. In addition, there will be a monitor in a boat drifting outward from the source taking hydroacoustic measurements. There will be observations of peak noise levels at increasing distances up to at least 100 meters from the source, to characterize the noise field and determine locations of maximum noise levels. Measurements from the boat will be made at intermediate distances of 25 meters and 50 meters from the cofferdam in directions upstream, downstream, and normal to the cofferdam. Additional drift measurements will be used to determine if there are any isolated areas of higher-than-expected sound pressure in between the defined monitoring distances. As stated in the previous section changes to this monitoring process may be necessary to fit site conditions. Underwater sound levels would also be measured any time a change in hammer type or size occurs. Additionally, as described in the "Data Reporting" section of this plan, if underwater SPLs for each pile type and size do not vary to a large degree, then, pursuant to CDFG 2081 Incidental Take Permit Section 4.3.12, Caltrans will provide a written request to the CDFG to discontinue hydroacoustic monitoring. Caltrans will also provide a written request to the Coastal Commission Executive Director to discontinue hydroacoustic monitoring.

The previously reviewed Marine Mammal Monitoring Plan (March 3, 2006) contained measures that would:

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1) include a 500 ft. safety zone designed to avoid exposing marine mammals to 160 dB or greater noise levels;

2) assure that pile driving will not commence at the beginning of a day unless the safety zone is clear (however, the plan provides that if a marine mammal later swims into the safety zone, pile driving will not be curtailed);

3) specify that pile driving will not commence at peak energy/noise levels but rather will begin with a "soft start" ("dry start") involving tapping the pile several times;

4) provide that noise levels will be monitored, and the 500 ft. will be modified up or down if actual noise levels are different than predicted;

5) provide that monthly monitoring summaries will be submitted to NOAA Fisheries; and

6) provide that a final report summarizing the monitoring and any general trends observed will be submitted within 30 days of the completion of the monitoring.

In addition, in accordance with the Commission's conditions, Caltrans has further clarified that the Commission staff will receive all monitoring reports, that pile driving will not commence in "low visibility" conditions (e.g., heavy fog or where visibility distance is less than the preclusion radius), that would include notifying the Commission staff if any "adaptive management" changes are proposed, that the period for monitoring for predation will be representative of the loudest (i.e., worst case) conditions, and that clarify the length of "before" and "after" periods for avian predation monitoring.

Caltrans also responded to the Commission staff's request that it elaborate on its definition of acute impacts that would trigger further coordination with regulatory agencies. Caltrans responded:

> *Birds that forage on fish include herons, egrets, gulls, terns, kingfishers, diving ducks, pelicans, cormorants and ospreys. During many field visits to the project site over the years, an osprey has been observed perched on the utility lines that run over the river. The other species that may forage on fish have either never been observed or only infrequently, although pelicans have been observed on the small mudflat southwest of the existing bridge according to a nearby resident.*
>
> *Some of the questions the monitor will be attempting to answer are: is there an increase in the number of birds, are birds hovering above the water, does foraging/diving appear to be random, i.e. are birds focusing their attention to one area, what is the intensity of the foraging, i.e. are birds behaving in a frenzied manner, what are birds catching. These questions, and others that may be developed, will be synthesized into the field data sheet.*

> *Conducting monitoring before and after pile driving occurs will assist in providing baseline data for "normal" avian predation behavior. As stated above under Response # 8, the before and after monitoring will occur during the same 10 day periods as the monitoring during pile driving.*

In periods during which the avian and marine mammal predation monitors are not on site, the general project biologist, as part of their duties, will observe and report any flocking of birds to the water surface in the vicinity of pile driving activities to the Resident Engineer. Additional predation monitoring details are contained in Caltrans' January 22, 2007 Monitoring Plan.

The Commission notes that, at the time of its previous hearing, ongoing discussions were occurring about the appropriateness of "sonar monitoring" (i.e., using underwater cameras) for effects on fish. The Commission's findings also noted:

> *Hydroacoustic Task Force. As part of a more programmatic effort to bring together top scientists in the field, review existing research on "barotrauma" and other pressure-related effects, develop noise thresholds for injury to fish, and conduct additional research to increase understanding of impacts, Caltrans is working in conjunction with Washington and Oregon State Transportation agencies, the Federal Highway Administration, the U.S. Army Corps of Engineers, NOAA Fisheries, the U.S. Fish and Wildlife Service, and CDFG. This effort has included establishment of a "Fisheries Hydroacoustic Working Group."*

Caltrans has not agreed to conduct sonar monitoring at the site of the subject project, and Caltrans has questioned the value of any such monitoring, compared to more comprehensive types of monitoring in a more controlled setting. In discussions subsequent to the Commission's action, NOAA Fisheries (NMFS), the Fish and Wildlife Service, and the California Department of Fish and Game, have not required sonar monitoring. In its responses to the Commission staff, however, Caltrans did note that "a feasibility study for use of acoustic survey methods in Ten Mile River is currently being prepared.". The Commission staff requested a timeline is for this feasibility study, a summary of what it would cover, a copy of the study once it is done, and, if it is completed while 10 Mile bridge construction is still ongoing, possible incorporation of its results. Other than a timeline (which was not a requirement of the Commission's permit conditions), Caltrans agreed, stating:

> *A report detailing the feasibility of using dual-frequency identification imaging sonar technology to observe fish behavior, authored by Dr. Tom Carlson, is currently being revised. A copy of the report will be forwarded to you upon its completion.*

Caltrans also agreed in its December 8, 2006, memo, that it would elaborate on future research being conducted to improve information about pile driving effects, and, if future research results can be applied to this project while it is still ongoing, to apply such results. Caltrans states:

Fisheries Hydroacoustic Working Group. Caltrans is an active participant in the Fisheries Hydroacoustic Working Group (FHWG) whose members include staff from resource agencies, the Federal Highway Administration, other state Departments of Transportation, and scientific technical experts. A goal of the FHWG is to reach agreement on:

- *the nature and extent of knowledge about the current scientific basis for noise effects on fish*
- *interim protective guidelines for pile driving noise, and*
- *future scientific research needed to satisfactorily resolve uncertainties regarding hydroacoustic impacts on fish species.*

As a member of the FHWG, Caltrans commissioned the preparation of a report to describe the nature and extent of current knowledge about the effects of sound (including those from pile driving activities) on fishes. The report, titled "Effects of Sound on Fish" (Hastings and Popper 2005), also identified the direction in which future studies are needed to address areas of uncertainty relative to measurement of sound and the response of fishes.

More recently, five internationally recognized scientists (Popper et. al. 2006) in bioacoustics collaborated on a White Paper titled "Interim criteria for injury of fish exposed to pile driving operations: a white paper" that supported the proposal of an interim criterion. The conclusions drawn, based upon the best available science, and using exceedingly conservative estimates, were that there should be a dual interim criterion including an interim criterion for single-strike cumulative energy (Sound Exposure Level (SEL)) and an interim criterion for peak pressure:

187 dB re: 1 μPa^2 •sec over 1-second and 208 dB re: 1 μPa_{peak} for single strikes

Copies of these reports can be provided upon request.

Transportation Pooled Fund Program. To begin addressing the topics listed above, Caltrans, along with several other transportation agencies, has allocated funds for two federal programs that will be assessing sound pressure levels on fish. The Transportation Pooled Fund Program will be implementing a study titled "Structural Acoustic Analysis of Piles" [http://www.pooledfund.org/projectdetails.asp?id=369&status=4]. A goal of the study is to provide a basis for selecting the proper materials and methods and noise reduction strategies for pile driving to economically ensure proper structural integrity while minimizing the adverse impacts of underwater noise. A copy of the program's objectives and scope of work is provided as an attachment.

National Highway Research Cooperative Program. In conjunction with the National Highway Research Cooperative Program (NHRCP), the second federal program that

Caltrans is involved with is titled "Predicting and Mitigating Hydroacoustic Impacts on Fish from Pile Installation" [http://www.trb.org/trbnet/projectdisplay.asp?projectid=763]. The goal of this program is to develop guidelines for the prediction and mitigation of the negative impacts on fish from underwater sound pressure and particle movement during pile and casing installation and removal. A copy of the program's objectives and proposed tasks is provided as an attachment.

Guidance Manual. In addition, Caltrans is moving forward with preparation of a guidance manual that will be titled Caltrans Guidance Manual for Assessing the Effects of Pile Driving Sound on Fish. The manual will be used by Caltrans staff in addressing the effects of sound on fish for projects. Specifically, the purpose of this manual is to assist Caltrans Project Engineers and Biologists in:

- *the preparation of environmental documentation and permit applications;*
- *the development of avoidance and minimization measures and conservation measures; and*
- *the assessment of potential impacts on fish and their habitat from sound generated from project-related pile driving, and methods to estimate compensation/mitigation.*

Notification of noise monitoring results. Caltrans will notify the CCC if noise resulting from pile driving exceeds 190 dB.

California Department of Fish and Game's Incidental Take Permit. The California Department of Fish and Game's (DFG) Incidental Take Permit requires Caltrans to implement one of five options to minimize effects to coho during pile driving activities.

Attached is a copy of an October 5, 2006 memo Caltrans sent to DFG stating we were selecting Option 4.3.13.2, which states "the Permittee shall not allow pile driving activities which result in peak pressure levels higher than 190 dB at 10m (32 feet) from the source. If SPLs exceed 190 dB Peak at any time, all pile driving activities shall cease until operations can be modified to maintain SPL below 190 dB Peak at all times." Also attached is a copy of the November 14, 2006 memo from DFG to Caltrans acknowledging which alternative will be implemented.

Caltrans also states:

Implementation of Relevant Research During Construction. Caltrans is committed to applying what may be learned from the research studies described above, as warranted and feasible, to the Ten Mile River bridge project. For instance, the Ten Mile River Bridge project is the first Caltrans project where both peak dB and SEL will be reported for active construction.

Finally, the Commission staff requested that Caltrans inform the Commission as to which of the non-binding "Agency Conservation Recommendations" it was going to be implementing. Caltrans responded:

> *Therefore, while they may provide useful information, Conservation Recommendations are not proposed to reduce the impacts of incidental take anticipated by the proposed project.*
>
> *The conservation recommendations, which are listed below, were reviewed in terms of their relationship to the proposed action, and logistics, time and cost related to both researching the proposal as well as the implementation of it.*
>
> *U.S. Fish and Wildlife Service Biological Opinion (Reference No. 1-14-1999-184.5)*
>
> *1. Survey and monitor populations of tidewater gobies in Ten Mile River and other waters having goby habitat in proximate to highways and highway bridges.*
>
> *Response: FWS staff recently provided Caltrans biologists with training on tidewater goby survey techniques. At the training's completion, Caltrans submitted an application to the FWS for a recovery permit that will allow Caltrans staff to perform surveys for the tidewater goby. Any surveys that are conducted, once the permit is received, will follow the Tidewater Goby Survey Protocol in the FWS' Recovery Plan for the Tidewater Goby, dated December 2005. Therefore, if the need arises surveys can be performed by permitted Caltrans staff.*
>
> *2. Assist the Service in implementing the recovery actions outlined in the recovery plan for the Howell's spineflower.*
>
> *Response: According to the original project design, access for demolition of the existing bridge included use of a route from the haul road that could have potentially resulted in affecting the Howell's spineflower. It has since been determined that construction work associated with demolition of the existing bridge could be limited, resulting in the existing spineflower population being protected.*
>
> *NOAA Fisheries' Biological Opinion (Reference No. 151422SWR2004SR8263 :GRS)*
>
> *1. The installation of the permanent steel piles with impact hammers should not occur between March 1 and June 15 to avoid adverse impacts to migrating juvenile listed salmonids.*
>
> *Response: The proposed work windows were designed to minimize effects to both the tidewater goby and the listed salmonid species (coho and chinook salmon and steelhead). Alternative work window scenarios were considered; however, other scenarios resulted in extended construction seasons, night work, excessive cost, or increased the potential impacts to listed species. Thus the construction work window for temporary pile driving is June 15-October 31 the first year of construction and*

September 15-October 31 any subsequent year. Permanent pile driving is proposed to occur year-round.

2. FHWA in coordination with the NMFS should initiate studies to acquire empirical data for establishing criteria for the cumulative effects to fish from exposure to underwater sound produced during multiple pile driving strikes.

Response: As stated above under Response # 2 (Acoustic thresholds/impacts), FHWA/Caltrans have provided funds for and are active members of established programs that will be studying how activities, such as pile driving, may affect fish. In addition, the paper titled "Interim criteria for injury of fish exposed to pile driving operations: a white paper" (Popper et. al. 2006), identified the types of studies that may refine the interim noise criteria, providing a better index of injury to fish. For example, the paper suggests "Studies are needed that examine cumulative effects of sound exposure on fish. Factors to be considered include cumulative effects of multiple strikes and the effects of different interstrike intervals on cumulative effects. In other words, is it appropriate to define a criterion based on one strike or many strikes, and if on many strikes, how many strikes over what period of time?"

3. FHWA should apply dual-frequency identification imaging sonar technology to measure, as feasible, the distribution, movement, and behavioral response of listed salmonids when sound pressures are generated during pile driving.

Response: In a meeting on April 27, 2006, FHWA and Caltrans agreed to evaluate the feasibility of using this technology, or an equivalent tool of higher resolution, during the construction of this project and to evaluate this technology as a research tool for assessing fish distribution, movement, and behavioral response to underwater sound produced during pile driving. Please also refer to Response # 7 (Feasibility study for acoustic monitoring) above.

4. FHWA should initiate a study to determine the distribution and abundance of juvenile listed salmonids inhabiting the Ten Mile River estuary during the summer months, as well as the density of juvenile listed salmonids during their migration through the estuary during the early-spring through early-summer months.

Response: Conducting fish studies, such as a snorkeling survey or sampling with baited minnow traps, were evaluated. These types of studies were found infeasible for the following reasons: they could result in additional effects to the endangered tidewater goby; the estuary where the project will take place is fairly shallow, making either type of survey logistically difficult; a presence/absence survey can only confirm no fish were present at the time of the survey, not necessarily that no fish are present; and in terms of coho a minimum of three consecutive survey years would be required to come to any reasonable conclusion due to the three cohort levels in the system.

Commission Conclusion. The Commission agrees that with the revisions included in the current hydroacoustic monitoring plan and other above-described commitments, the plan is

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consistent with the Commission's conditions because it contains sufficient data points and appropriate methodology adequate to characterize the acoustic footprint, describes the criteria used for fish injury thresholds, sufficient to enable a determination of maximum sound levels, will report results to the Commission staff, and will seek Commission staff authorization for any changes to the plan. The Commission also agrees that with the additional commitments on the marine mammal monitoring and avian predation plans, these plans are also adequate to comply with the Commission's conditions. However, the Commission also wishes to reiterate that in the event the monitoring results establish that the acoustic thresholds are being exceeded (i.e., in the event Caltrans' pile driving exceeds 190 dB, as defined by NMFS' BO, Condition 19 [under which an exceedance would occur "If underwater sound produced during five or more strikes on a single day exceeds the anticipated level of 190 dB peak at 10 meters from the pile being installed]), the Commission retains the authority to "reopen" its federal consistency authorization (CC-74-05) under 15 CFR Sections 930.65 and 930.66). In addition, Condition 2 of the Commission's permit (CDP No. 1-06-022) also triggers additional mitigation requirements in the event sound levels exceed the predicted 190 dB limit (at 10 meters).

STATE OF CALIFORNIA – THE RESOURCES AGENCY

ARNOLD SCHWARZENEGGER *GOVERNOR*

CALIFORNIA COASTAL COMMISSION

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Hearing Date: 6/16/06
Approved w/Conditions:
Vote: 9-0, 6/16/06

EXHIBIT NO. **7**
APPLICATION NO.
1-06-022 – CALTRANS
CONDITION COMPLIANCE
ADOPTED FINDINGS
(1 of 107)

ADOPTED FINDINGS
Revised Staff Report

APPLICATION NO.	**1-06-022**
APPLICANT:	**California Dept. of Transportation Caltrans, District 1, Eureka**
PROJECT LOCATION:	Highway 1, Ten Mile River Bridge, approx. 7 miles north of Fort Bragg, unincorporated Mendocino County
PROJECT DESCRIPTION:	Replace the Ten Mile River Bridge; demolish and remove the existing bridge.
RECOMMENDATION:	Approval with Conditions
MOTION & RESOLUTION:	Page 7
LOCAL APPROVALS:	None required.
OTHER APPROVALS RECEIVED:	State Lands Commission lease 1/6/06.

OTHER APPROVALS REQUIRED: California Department of Fish and Game: 1602 Streambed Alteration Agreement and California Endangered Species Act Biological Opinion Consistency Determination; Regional Water Quality Control Board: Section 401 Certification, National Pollutant Discharge Elimination System permit; Biological Opinion, U.S. Fish and Wildlife Service; Biological Opinion, National Oceanic and Atmospheric Administration's National Marine Fisheries Service; 404 Permit, Army Corps of Engineers.

Commission Action at June 16, 2006 Hearing: Adopted Findings

The Commission held a public hearing and approved the permittee's application for Coastal Development Permit 1-06-022, with conditions, at the meeting of June 16, 2006. The adopted conditions and findings for approval differ slightly from those contained in the written staff

recommendation dated June 1, 2006 (Attachment A). Prior to the public hearing, staff prepared an addendum dated June 15, 2006 to the recommendation contained in the staff report (Attachment B). At the public hearing, the Commission further revised the applicable special conditions as reflected in the draft adopted special conditions (Attachment C), with the changes made at the hearing shown either in bold double underline (text additions) or in bold strike-through (text deletions).

The Commission adopted the staff recommendation as modified and as further amended by the Commission.

The resolutions, conditions, and findings commencing on page 8 adopted by the Commission on June 16, 2006 upon conclusion of the public hearing.

SUMMARY

(This summary was provided in the previous staff report dated June 1, 2006)

For a more expansive discussion of the background of this project and the associated timeline, see the combined staff report for Public Works Plan No. 1-06-PWP and Public Works Project No. 1-06-001-PWP, June 16, 2006 Agenda Items 5a and 6a, incorporated here by reference.

The California Department of Transportation (hereinafter "Caltrans", "applicant" or "permittee" depending on specific citations) has submitted an application for a coastal development permit for the proposed replacement of the Ten Mile River Bridge on Highway 1, north of Fort Bragg, in Mendocino County. The primary purpose of the project is to replace the aging, seismically unsafe bridge with a new, safer bridge.

Caltrans urgently requests an expedited Commission review of the remaining approvals that are pending, so that Caltrans can solicit bids for the construction of the last remaining seismic replacement bridge project statewide in the Coastal Zone.

The Commission previously reviewed the project and conditionally concurred with Federal Consistency Compliance Certification (CC-074-05) in November 2005 (revised findings adopted March 2006). Therefore, to expedite the final staff review of the project, the staff analysis relies on the pertinent adopted findings for CC-074-05 that are similarly applicable to the portions of the project (generally, the bridge) subject to CDP 1-06-22. Other, off-bridge elements of the project that are subject to the proposed Public Works Plan include approximately 2,000 linear feet of new, realigned highway to match the bridge to the existing highway, and an approximately 2,841-sq.-ft. turnout for parking located about 450 feet south of the bridge, west of the highway. (See staff report for items Fri 5a & 6a, June 16, 2006 Agenda).

<u>The most important issues raised in this staff report are</u>: 1) consideration of Caltrans' <u>revised proposal</u> for configuration of the pedestrian and paved shoulder components of the bridge (Caltrans presents an alternative design that does not completely follow the Commission's requirements in conditionally concurring with CC-074-05 but which the

staff recommends that the Commission approve), 2) Marine resource protection: including hydroacoustic impacts to fish and marine mammals that may be caused by pile-driving, compensatory mitigation for residual impacts to fish that may be caused by pile-driving, eelgrass impact monitoring and mitigation, and water quality; 3) Permanent protection of the Coastal Trail corridor located on the new bridge; and 4). Final design consideration for bridge rails (staff recommends that an amendment to the proposed project be required for future Commission consideration of final bridge rail designs after further design development and review).

The project was first presented to the Commission pursuant to Federal Consistency staff review in November 2005. Commission staff presented the reason for undertaking Federal Consistency review prior to coastal development permit review at that time:

> "... The Commission and Caltrans staff agreed in February of this year to pursue federal consistency review for the entire project, with the objective to resolve all Coastal Act issues, and to simplify the subsequent Coastal Development Permits, and to assist Caltrans in meeting the review deadlines of state seismic retrofit legislation. That legislation expired at the end of June, but the consistency review process was continued, in order to bring the project to the Commission in a timely manner, given Caltrans' mandate to expedite replacement of the bridge."
>
> (From transcript of Commission hearing on Agenda Item No. 20b, November 16, 2005, attached to the staff report for June 16, 2006 Agenda Items 5a & 6a as Exhibit 4A)

The Commission conditionally concurred with Caltrans' Consistency Certification (CC-074-05) at the November 16, 2005 hearing (revised findings adopted March 10, 2006). The Commission required the proposed 8-ft-wide paved shoulders on the bridge to be revised to distribute the 8-ft width between 4-ft.-wide paved traffic shoulders and 4-ft.-wide paved pedestrian corridors on each side of the bridge, with the walkways separated from traffic by guard rails.

Caltrans also agreed at the November hearing to address the Commission's concerns regarding the visual elements of the various types of rails required for the project. A Commission subcommittee was re-activated at that time to examine the rail design issues and to report back to the Commission (the subcommittee has since met twice).

Caltrans has declined in the present proposal to implement the full range of revisions previously required by the Commission, citing Americans with Disability Act (ADA) requirements, safety, and the cost and time required to undertake the full redesign of the project that Caltrans has determined would be necessary. Instead, Caltrans proposes to construct 6-ft-wide paved outside shoulders on each side of the bridge, and one 5-ft.-wide walkway for the Coastal Trail on the west side of the bridge. The walkway would be separated from the traffic side by a guard rail (ST-10, 31 inches high, 18 inches wide). The outer rail would be the "picket" style pedestrian rail installed on the Noyo Bridge in Fort Bragg, which is 48 inches high. The outside rail on the east side would remain the

ST-20 type of rail topped by an additional rail bar to achieve a 54-inch height (Caltrans states that this height is necessary for the safety of bicyclists).

Caltrans stated in the pending application, and specifically in the proposed Public Works Plan for the portion of the project presently in the Commission's appellate jurisdiction that a redesign of the project to incorporate the revisions previously required by the Commission in the context of the Commission's conditional concurrence in CC-074-05 would require:

> ***"... a complete redesign, resulting in a several million dollar increase in project cost, and the project would be delayed a minimum of three to five years..."***
> (PWP, April 2006, page 8)

Caltrans also states that the Federal Americans with Disabilities Act (ADA) requires the pedestrian sidewalk to be a minimum of five feet wide and that no design exceptions will be made.

Though Caltrans tentatively proposes to reduce the paved shoulders from the previously proposed 8-foot width, Caltrans has not fully committed to this change, noting that such a revision is contingent upon the Commission's expedited approval of the subject project (see except from PWP, page 8, item 3 below, and Exhibit 1A) and apparently reserving the right to revert to the 8-foot-width if the contingency of expedited Commission approval is not met:

> *" ...There are four main reasons why Caltrans would develop a design exception for six-foot shoulders, but cannot approve an exception for four-foot shoulders:*
>
> *1) There is a significant (approximately 44%) reduction in expected collision rates when six-foot shoulders are used as compared to four-foot shoulders.*
>
> *2) The six-foot shoulder is a significant improvement over a four-foot shoulder for both vehicular and non-motorized traffic traversing the bridge. For example, a typical bicyclist is 30 inches wide. Four-foot shoulders provide a bicyclist less than one foot on either side between the bridge railing and vehicle lane.*
>
> ***3)*** *Given the urgency of this safety seismic bridge project,* ***a design exception for six-foot shoulders would be approved only if the project could be permitted and constructed with minimal delay.*** (Emphasis added)
>
> *4) Increased environmental impacts due to the larger support columns required for a wider bridge.*

Caltrans therefore has <u>provisionally</u> revised the proposal previously considered by the Commission and presently proposes to install a new bridge at the Ten Mile River crossing with the following dimensions and features, and other project elements:

Total bridge width:	approximately 45 feet
Traffic lanes:	two/12-ft.-wide[1]
Paved shoulders:	two/6-ft.-wide, 54-inch-high ST-20 rail, east side only
Walkway:	one/5-ft.-wide, west side, with 1.6-ft.-high inside ST-10 guard rail, 48-inch-high "picket style" pedestrian outer rail
Bridge Lighting:	none proposed
Off-Bridge:	reduced total length of paved shoulders tapering to point of conformity with existing highway
Replacement Parking:	turnout parking, entrance 445 feet south of new bridge

To Obtain Further Information:

North Coast District:
For further information about this report or the public works plan process, please contact Melanie Faust, at the letterhead address and telephone number.

Federal Consistency Unit:
For further information about the previous Consistency Certification (CC-074-05), contact San Francisco Headquarters: (415) 904-904-5200, Larry Simon. For further information about the acoustic trauma associated with in-water construction, contact Mark Delaplaine, Federal Consistency Unit Supervisor at the same location and telephone number.

Statewide Caltrans Liaison Program:
For further information about the Commission's Statewide Caltrans Liaison program, or the Commission's "Road's Edge" Subcommittee that continues to review design options for the rail elements of the Ten Mile River Bridge, contact Tami Grove at the Central Coast District Office, Santa Cruz: (831) 427-4863, or Sheila Mone, (Intergovernmental Resource Partnering Program Chief, Caltrans) at (916) 653-8746.

To Submit Public Comments:

Public comments concerning this staff report may be provided to the North Coast District Office at the letterhead address. Please note that Commission staff cannot guarantee receipt of comments transmitted electronically.

Availability of environmental information:

All environmental information relied on by the Commission and its staff is available for review at the above-referenced Eureka Office of the California Coastal Commission. Caltrans prepared an Initial Study/Draft Proposed Mitigated Negative Declaration dated

[1] According to the California Department of Motor Vehicles, a typical passenger car is 6 feet wide. DMV indicates that a typical logging truck is 8 feet wide, the maximum vehicle width permissible without a special wide-load permit and the use of flags, pilot cars, etc.

March 2006 and released April 3, 2006 (the document is attached to the staff report for June 16, 2006 Commission Hearing Item Fri 5a and 6a, as Exhibit 6A) that had not been finalized at the time of publication of this report.

Related Permits:

Federal Consistency Certification No. CC-074-5 (Caltrans): Conditional Commission Concurrence with Consistency Certification prepared by Caltrans, November 16, 2006, revised findings adopted March 10, 2006.

June 16, 2006 Agenda Item Fri 9b: CDP Amendment Application No. A-1-MEN-98-017-A2 (Perry/Smith). Note: Caltrans seeks an amendment to the subject permit to remove 3 acres of non-prime agricultural land from an otherwise deed-restricted area for preservation of agricultural land, to construct the Ten Mile Bridge project.

June 16, 2006 Agenda Item Fri 5a & 6a: Public Works Plan 1-06-PWP and Specific PWP Project PWP 1-06-01: Note: the Ten Mile Bridge project traverses areas of Mendocino County's certified Local Coastal Program at each end of the proposed project and the bridge traverses the Commission's retained coastal development permit jurisdiction in the middle. Caltrans seeks Commission certification of a Public Works Plan and Project for the portion presently located in the area of the County's LCP.

Previous related permits: CDP 1-00-032 (Caltrans): regular permit for geotechnical planning surveys of the Ten Mile Bridge area, required as follow-up for Emergency CDP No. 1-00-031-G, granted by the Executive Director on July 7, 2000, and processed as an emergency because Caltrans invoked the 15-day permit review turnaround then available to the agency under the since-expired seismic retrofit legislation (Senate Bill 805). Geotechnical study including drilling 14 borings to characterize subsurface formations for Ten Mile Bridge design; Mendocino County Emergency Permit EM 5-00 for geotechnical study borings in the Commission's appellate jurisdiction (Mendocino County certified LCP) related geotechnical test borings outside of the area CCC retained permit jurisdiction.

1A. Regional Map and Project Plans (copy of reduced set prepared by Caltrans).

2A. (1) Hydroacoustic Monitoring Plan for Ten Mile River Bridge, dated January 30, 2006, submitted by Caltrans, and (2) previous memorandum to Caltrans by Illingworth & Rodkin, Inc., dated September 16, 2005 with previous draft plan.

3A. Eelgrass Mitigation and Monitoring Plan (revised), dated March 17, 2006, prepared by Caltrans.

4A. (1) Chart describing paved shoulder widths/accident rates, submitted via email by Caltrans and forwarded to North Coast District Staff with related explanation by the Commission's Statewide Caltrans Liaison, Tami Grove, May 29, 2006; (2) Undated data sheet on accident statistics for Ten Mile Bridge submitted via e-mail by Caltrans Intergovernmental Liaison Program Chief, Sheila Mone, on May 17, 2006 – prepared by Caltrans showing revised accident statistics for the Ten Mile River Bridge, also forwarded to District staff by Caltrans Liaison staff.

5A. Caltrans memorandum prepared by David Melendrez, Chief, North Region Office of Environmental Engineering – North, dated April 13, 2006

6A. Caltrans memorandum prepared by Lisa Embree, Associate Biologist, Caltrans Environmental Branch E2, dated April 30, 2006.

7A. Revisions to project description made by Caltrans, dated April 12, 2006.

8A. Outline of studies /pile driving and effects on fish (from "Effects of Sound on Fish" (Hastings & Popper, Caltrans, January 28, 2005)

9A. Sound metrics explanation.

10A. *Interim Criteria* for Injury of Fish Exposed to Pile Driving Operations: A White Paper (Popper, Carlson, Hawkins, Southall, and Gentry, May 15, 2006)

ABOUT EXHIBIT REFERENCES:

To expedite review of the project, the adopted findings for CC-074-05 approved by the Commission on March 10, 2006 are incorporated below where applicable and are set forth in **Arial bold** font for the reader's convenience. Exhibit references from the adopted findings are numbered 1, 2, 3, etc. Therefore, to distinguish these exhibits from the new exhibits attached hereto, the new exhibits for this report are numbered 1A, 2A, 3A, etc. In addition, the exhibits to the report for June 16, 2006 Agenda Items Fri 5a and 6a, for the remaining portion of the Ten Mile Bridge project that traverses the area proposed for inclusion in a new Public Works Plan may be of interest to the reader of this report (the adopted findings for CC-074-05 and the hearing transcript for the November 15, 2006 hearing on CC-074-05, are attached to that report as Exhibits 3A and 4A, respectively, for example). Finally, Caltrans prepared one complete set of the reduced project plans in color. These were attached to the staff report for items 5a and 6a, as Exhibit 5A. A black and white copy of the plans is attached as an exhibit to this staff report.

JURISDICTION AND STANDARD OF REVIEW:

Although the proposed bridge replacement and associated Highway 1 realignment are one project, the physical project is bisected by the boundary between the coastal development permit jurisdiction of the Commission and Mendocino County.

This application seeks Coastal Commission authorization for the portions of the project that are within the area of the Commission's retained jurisdiction. These areas include areas subject to the public trust. Therefore the standard of review the Commission must apply to the project is the Chapter 3 policies of the Coastal Act.

I. RESOLUTION ADOPTED BY COMMISSION:

Resolution to Approve Permit:

The Commission hereby approves the Coastal Development Permit for the proposed development, subject to the conditions specified below, on the grounds that, as conditioned, the development will be in conformity with the policies of Chapter 3 of the Coastal Act. Approval of the permit complies with the California Environmental Quality Act because either 1) feasible mitigation measures and/or alternatives have been incorporated to substantially lessen any significant adverse effects of the development on the environment, or 2) there are no further feasible mitigation measures or alternatives that would substantially lessen any significant adverse impacts of the development on the environment.

II. STANDARD CONDITIONS:

1. Notice of Receipt and Acknowledgement. The permit is not valid and development shall not commence until a copy of the permit, signed by the permittee or authorized agent, acknowledging receipt of the permit and acceptance of the terms and conditions, is returned to the Commission office.

2. Expiration. If development has not commenced, the permit will expire two years from the date on which the Commission voted on the application. Development shall be pursued in a diligent manner and completed in a reasonable amount of time. Application for extension of the permit must be made prior to the expiration date.

3. Interpretation. Any questions of intent of interpretation of any condition will be resolved by the Executive Director of the Commission.

4. Assignment. The permit may be assigned to any qualified person, provided assignee files with the Commission an affidavit accepting all terms and conditions of the permit.

5. Terms and Conditions Run with the Land. These terms and conditions shall be perpetual, and it is the intention of the Commission and the permittee to bind all future owners and possessors of the subject property to the terms and conditions.

III. SPECIAL CONDITIONS

1. COMMISSION REVIEW OF FISH INJURY AND ACOUSTIC MONITORING

A. WITHIN NINETY (90) DAYS AFTER COMMISSION APPROVAL OF COASTAL DEVELOPMENT PERMIT 1-06-022, or within such additional time as the Executive Director may grant for good cause, Caltrans shall submit a copy of the final acoustic monitoring plan to the Commission for review and approval at a regularly scheduled public hearing; and

B. The plan shall include a description of how the acoustic footprint will be determined, what equipment/personnel efforts to observe or detect fish reactions to pile driving are proposed, the length of time and number of sound measurement replicates that will be consecutively collected to adequately characterize the sound footprint and maximum hydroacoustic impact generated by project activities, how Caltrans proposes to adequately monitor hydroacoustic affects on fish if visibility is impaired (such as by weather, available light, or turbidity), what criteria will be used for fish injury thresholds, and how such criteria, and fish injury, will be measured. The acoustic footprint monitoring shall provide adequate data point locations (including several hydrophone locations between the proposed 10 meter and 100 meter locations) sufficient to adequately characterize the acoustic footprint. In addition, if sonar monitoring of fish behavior during pile-driving is required by state and/or federal agencies, the method and equipment used to conduct such monitoring, and the means of describing and reporting the results shall be included in the Acoustic Monitoring Plan. The plan shall additionally include any recommendation for species conservation or protection, and any specific requirements or conditions imposed by NOAA National Marine Fisheries Service, U.S. Fish & Wildlife Service, or California Department of Fish & Game; and

C. Project activities that may result in hydroacoustic impacts shall not commence until the Commission has considered the proposed final plan at a regularly scheduled public hearing, which shall be scheduled as soon as practicable after Caltrans submits the final plan. The Commission may require additional measures for the purpose of collecting sufficient information about the affects of pile driving on the fish that inhabit the Ten Mile River.

2. <u>COMMISSION REVIEW OF FISHERIES HABITAT MITIGATION/ ENHANCEMENT PLAN</u>

A. WITHIN NINETY (90) DAYS AFTER COMMISSION APPROVAL OF COASTAL DEVELOPMENT PERMIT 1-06-022, or within such additional time as the Executive Director may grant for good cause, Caltrans shall submit to the Commission a preliminary plan for compensatory mitigation of adverse impacts to fish in the Ten Mile River that are reasonably anticipated through the assessments of state and federal agencies in rendering "Biological Opinions"(or other analyses) applicable to the proposed project. The plan shall include details of the proposed mitigation, including the location, scope of work, objectives, cooperating partners, timeline for completion, and means of verifying project success. The Commission shall consider the preliminary mitigation plan at the earliest practicable hearing following submittal of the plan by Caltrans; and

B. To the extent that fish habitat enhancement project(s) are proposed to satisfy mitigation obligations, the projects shall benefit the habitat of the affected species proportionally to the impacts sustained by each; and

C. The Plan shall require mitigation of coho and chinook salmon, northern California steelhead trout, and tidewater goby habitat commensurate with the level of unmitigated residual adverse impact on these species determined likely at the anticipated impact

threshold (the impacts that would occur if the project does not exceed the expected peak sound pressure threshold); and

D. The Plan shall include a further requirement that if the acoustic footprint monitoring establishes that, or ongoing monitoring document that adverse effects would be more extensive than predicted, additional mitigation commensurate with the level of additional impact shall be required. For example, if the initial assumption will be a defined estimate of numbers of fish exposed to a particular decibel level, and the actual acoustic footprint monitoring shows the footprint exceeds the predicted footprint, additional noise reduction strategies and/or offsite mitigation may be required; and

E. Upon completion of all project activities that may generate hydroacoustic impacts, Caltrans shall submit to the Commission a final report (together with the final acoustic monitoring report required by Special Condition 3 below), estimating the extent of adverse impacts of project activities deemed to have exceeded the levels originally predicted on the four fish species listed above, at any life stage of these species present during pertinent project activities. Caltrans shall describe proposed mitigation in the form of specific habitat improvement projects for the affected species in a manner reasonably proportionate by species and degree of adverse effects sustained, including a timeline to accomplish the proposed mitigation, and the method of verifying successful completion. Alternatively, Caltrans may propose payment of compensatory fees commensurate with the level of impact to some or all of these species, in an amount deemed reasonable by the Commission. Such fees, if required, shall be collected and distributed in accordance with the Commission's direction for projects that would provide direct benefits to the habitat of the affected species within or as close as is feasible to the Ten Mile River or its watershed. In reviewing the proposed mitigation, the Commission shall assign the greatest benefit to projects that provide in-kind, in-location habitat mitigation that benefits the species affected by the Ten Mile River Bridge construction, in preference to projects that provide in-kind but offsite mitigation, with declining value based on increasing distance from the impact site, and shall finally assign the least value to out of kind mitigation; and

F. Caltrans shall submit the final mitigation proposal not later than sixty (60) days after project completion, and the Commission shall consider the final mitigation proposal at the earliest practicable hearing following submittal of the plan by Caltrans.

3. <u>SUBMITTAL OF ACOUSTIC MONITORING REPORTS</u>.

Upon commencement of pile-driving, Caltrans shall timely submit monthly monitoring summaries, annual monitoring reports, and a final monitoring report prepared for NOAA Fisheries, and or any similar reports to be prepared for the U.S. Fish and Wildlife Service and the California Dept. of Fish and Game, to the Executive Director for review.

4. <u>REVISED MARINE MAMMAL MONITORING PLAN</u>.

WITHIN 90 DAYS AFTER COMMISSION APPROVAL OF CDP 1-06-022, Caltrans shall submit for the review and approval of the Commission, a revised Marine Mammal

Monitoring Plan that provides that the Executive Director shall receive timely copies of all pertinent reports generated, and prohibits construction during periods of reduced visibility (i.e., the observer must be able to see the required distance, or pile driving may not commence until visibility has improved and the observer can verify that the area is clear of marine mammals).

5. REVISED EELGRASS MITIGATION AND MONITORING PLAN

PRIOR TO ISSUANCE OF CDP 1-06-022, Caltrans shall submit a revised Eelgrass Mitigation and Monitoring Plan for review and approval of the Executive Director. The revised Plan shall include a) pre- and post-construction surveys to establish the extent of temporary impacts on eelgrass coverage, if any, resulting from the deployment of casing shells around the trestle piles and/or the installation of the trestle piles over time during project operations (in addition to surveys already proposed for the temporary impacts of shading); b) success criteria for regrowth of temporarily-affected eelgrass habitat detected through the comparative surveys; c) success criteria for regrowth of eelgrass replanted where cofferdam excavations occurred; d) mitigation proposal to replant eelgrass at a minimum ratio of 1.2:1 if approved success criteria are not met as determined by the results of the subject surveys or, if surveys conducted one year after final trestles were removed indicates that eelgrass has not grown back in the area affected by temporary trestle pile installation, Caltrans shall replant eelgrass in these areas at a minimum ratio of 1.2:1; e) follow-up monitoring and adaptive management measures, milestones, and final success criteria to ensure that performance standards resulting in the net gain of eelgrass habitat asserted by Caltrans in seeking approval of CDP 1-06-022 are met. The revised plan shall at a minimum incorporate the guidance of the Southern California Eelgrass Mitigation Policy for acceptable success criteria in assessing eelgrass transplant success.

6. PERMIT OBLIGATIONS

In accepting the Commission's approval of Specific PWP Project 1-06-001, Caltrans agrees and accepts that:

A. If the approved project will be contracted out for implementation, it is Caltrans' responsibility to ensure that the relevant bidding documents include the requirement that the contractor and any employees, subcontractors, agents, or other representatives of the contractor or contractors who are responsible for constructing any portion of the project, shall undertake such activities in full compliance with the project approved pursuant to CDP 1-06-022, including all terms and conditions imposed by the Commission in approving the permit. It shall be Caltrans' responsibility to ensure that the bidding documents contain special provisions necessary to incorporate all requirements imposed by the Commission or other state or federal agencies with regulatory authority over the project. It shall also be Caltrans' responsibility to ensure that the winning bid for the construction of the proposed project is adequate to ensure that the selected contractor has taken into consideration and provided for the full cost of compliance with all requirements imposed by the Commission pursuant to the Commission's approval of CDP 1-06-022, as well as all requirements of other state and federal agencies. A copy of

the adopted findings for CDP 1-06-022 shall be provided to Caltrans subsequent to final Commission action, and a complete copy of the adopted findings and final plans approved by the Executive Director shall be attached to the bidding documents by Caltrans for reference by potential bidders.

B. After the contract is awarded, Caltrans shall ensure that the contractor(s), subcontractor(s), or other parties selected by Caltrans or otherwise designated to implement any portion of the project approved pursuant to CDP No. 1-06-022, are fully informed of, and continuously comply with, the obligations set forth in the adopted findings referenced in Subparagraph A above. Caltrans shall ensure that a complete copy of the adopted findings is maintained on the job site at all times and that each contractor undertaking any portion of the development authorized herein has a copy of the adopted findings upon execution of the contract for the subject project.

C. All activities associated with performing the development authorized pursuant to CDP 1-06-022 shall at all times be undertaken in full accordance with the terms and conditions imposed by the Commission in conditionally approving CDP 1-06-022. It shall at all times be Caltrans' responsibility to fully ensure such compliance by any party to whom Caltrans assigns the right to construct or undertake any part of the activities authorized herein.

D. Any proposed changes to the approved project shall be reported to the Executive Director. No changes to the approved project shall occur without a Coastal Commission-approved amendment to CDP 1-06-022, unless the Executive Director determines that no amendment is legally required.

7. CONSTRUCTION RELATED REQUIREMENTS

In accepting the Commission's approval of CDP 1-06-022, Caltrans agrees that its representatives, agents, employees, contractors, and the contractor's agents, officers, and employees, or subcontractors shall comply with the following construction-related requirements for any portion of the proposed project that is located within the area that is subject to CDP 1-06-022:

A. No construction materials (other than falsework bents and materials related to providing best management practices ((BMPs)) for mitigation), debris, graded soils, or waste shall be stored or placed within the Ten Mile River corridor including streambed or banks, or adjacent riparian areas, or other areas where it may enter the Ten Mile River or other coastal waters, whether directly or indirectly; and

B. No machinery shall be allowed at any time in the Ten Mile River corridor except as specifically required to install the in-water support piles and other structures approved herein, or to undertake monitoring or barge-based activities; and

C. Staging and storage of construction machinery, materials, equipment, fuel, or any other material, or storage of debris or graded material, shall not take place within sensitive habitat areas that shall be identified and marked in the field by a qualified biologist prior to commencement of construction and as often as needed thereafter to continuously maintain the identification of sensitive site areas; and

D. Demolition of the existing bridge or roadbed shall not be undertaken through the use of explosives, and only portions of the bridge deck or other structures to be

demolished that are located completely over dry land, and not within wetlands or other environmentally sensitive habitat areas, may be dropped to the ground below the demolition activities. Support trestles and other equipment or materials shall be utilized to capture such debris which shall thereafter be removed directly from the trestle deck for disposal; and

E. Demolition and disposal of debris, and all construction activities shall at all times be undertaken in a manner that does not result, whether directly or indirectly, in discharge to coastal waters, including the Ten Mile River channel (top of bank to top of bank, including banks, gravel bars and wetted channel) of rubble, debris, chemicals, concrete (wet or dry), grout, fuel, waste material of any kind, construction materials of any kind, or significant amounts of dust; and

F. All debris, materials, equipment, vehicles, staging and storage features, concrete washout areas, fueling location, and any other material or temporary feature associated with project construction shall be removed immediately after project completion and the affected area returned to preconstruction conditions or restored in accordance with other special conditions set forth herein, as applicable; and

G. All waste material or excess graded material generated by demolition or construction shall be removed from the construction site and disposed of in an upland area outside of the coastal zone where such materials may be lawfully disposed and will not be discharged into waters tributary to coastal waters if the disposal is proposed in the coastal zone; and, not less than thirty (30) days prior to commencement of activities that will result in debris or wastes subject to such disposal, Caltrans shall submit evidence to the Executive Director's satisfaction that all necessary, final coastal development permits have been obtained and that the activities proposed will not adversely affect coastal resources. If disposal is undertaken within the coastal zone, it shall be in a manner and at a location that is not visible from public viewing areas, does not displace agriculture, or affect sensitive habitat or species, or occupy wetlands or wetland buffers. Caltrans shall keep complete written records of the kind, volume, and location of any disposal of materials generated by the subject project activities and shall provide an interim report of such disposal annually, and a final report and complete copy of these records within thirty (30) days of project completion, to the Executive Director; and

H. Fueling shall take place in a single designated offsite area that is set up to fully contain any potential spill without release outside of the designated area, and the designated area shall be equipped with all materials necessary to control and cleanup any spill that may occur. The designated area may not be located within the Ten Mile River corridor from top of bank to top of bank, or within 100 feet from top of bank on either side of the river. Only equipment that cannot be readily relocated to the designated offsite fueling location may be fueled in other areas of the site (cranes, large tracked vehicles, and large rubber-tired vehicles only) and these shall be re-fueled only by a California Department of Fish and Game-certified over-water re-fueler, in a manner authorized in accordance with all requirements of the Department of Fish and Game and the Regional Water Quality Control Board, including but not limited to the requirement that such re-fueling be undertaken by a minimum of two crew members certified for such operations, with one on standby to shut off the flow of fuel and the other at the delivery point, in constant communication with each other, with full deployment of absorbent pads with

sufficient capacity to absorb the maximum amount of fuel that could escape from the fueling hose before shutoff occurs in the event of equipment failure. No fueling of any kind may take place except during daylight hours and when visibility is sufficient for the re-fueling crew to maintain visual contact; and

I. Oil absorbent booms and/or pads shall be on site at all times during project construction. All equipment used during construction shall be free of oil and fuel leaks at all times, and where parked or operated over the river channel from top of bank to top of bank, oil pans or other containment devices shall be continuously placed beneath such equipment to ensure that leaks that do arise will not enter the river environment; and

J. Cement shall be prepared and poured in a manner that will prevent discharges of wet cement into coastal waters including, but not limited to, placement of measures such as catch basins, mats or tarps beneath the construction area to prevent spills or overpours from entering coastal waters; and

K. Rinsate from the cleaning of equipment, including cement mixing equipment, shall be contained and handled only in upland areas and otherwise outside of any environmentally sensitive habitat area; and

L. Reporting protocols and contact information for the appropriate public and emergency services/agencies in the event of a spill shall be prominently posted on site at all times; and

M. All forms that may be utilized for wet concrete pours shall be grout-sealed, allowed to cure completely, and water-tested under the supervision of the monitoring biologist and resident engineer, to ensure as complete a seal as possible before any wet concrete or other chemical treatments may be applied to the forms; and

N. PRIOR TO COMMENCEMENT OF CONSTRUCTION, Caltrans shall provide to-scale plans showing the detailed limits and locations of any approved staging, fueling, or concrete washout area subject to the review and approval of the Executive Director before construction may commence, and it shall be Caltrans' responsibility to ensure that no other area of the site is used for these purposes at any time; and

O. No vegetation removal, including clearing, grubbing, limbing, trimming, or other disturbance of existing vegetation may occur between March 1 and August 31 of any year unless a qualified biologist provides a survey undertaken to the satisfaction of the Executive Director not less than ten (10) days prior to proposed commencement of such activities, demonstrating conclusively that no birds are nesting in the area that would be affected, and the results of the survey have been provided to the Executive Director's satisfaction not less than five (5) days prior to proposed commencement of such activities; and

P. No demolition activities shall be undertaken in an area of the site subject to CDP 1-06-022 that would disturb nesting birds or bats utilizing any portion of the existing bridge during the nesting season for nest building migratory birds March 1 through August 31, and sufficient bat boxes to provide alternative roosting sites for bats utilizing the existing bridge must be affixed to the new bridge as soon as feasible after construction but not less than three (3) months prior to the demolition of the existing bridge. Prior to demolition activities, a qualified biologist shall verify that no nesting or roosting species are using the old bridge, and if any roosting species are still using the bridge, the biologist shall relocate the affected species before demolition activities commence. A summary of the relocation activities shall be provided to the Executive Director prior to commencing demolition; and

Q. Caltrans and its designated representatives (which includes contractors and their representatives) shall undertake development at all times in accordance with the requirements set forth herein, and it shall be Caltrans' responsibility to oversee and to ensure such compliance by all parties undertaking any portion of the project authorized herein, at all times; and

R. No changes to these requirements may be approved without an amendment to CDP 1-06-022, unless the Executive Director determines that no amendment is legally required.

8. EROSION CONTROL AND REVEGETATION PLAN

A. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION, Caltrans shall submit, for the review and approval of the Executive Director, a final combined Erosion Control and Revegetation Plan for all areas disturbed by construction within the area subject to CDP 1-06-022, including disturbance necessary to construct bridge abutments and shoulders, temporary and relocated access roads, and approved staging, fueling, and concrete washout areas to the extent that these are located within the subject area of the project. The plan shall provide for both temporary and permanent erosion control and revegetation in accordance with the revised Revegetation Plan dated September 19, 2005, submitted by Kelley Garrett, Caltrans biologist, shall include a site plan to scale with a detailed planting plan overlay specifying the species, size, source location of propagules, and shall include detailed performance standards, milestones, and specific adaptive management measures. The final plan shall include specific rainy season erosion control measures, including, but not limited to, the following measures or their equivalents as specifically matched to the subject site and conditions: (1) the use of geotextile fabric and gravel to cover temporary access roads during construction, (2) the complete removal of all geotextile fabric and gravel, (3) placement of erosion control measures such as mulch, fiber rolls, or straw, and (4) replanting the disturbed area with locally native vegetation. Other features such as natural boulders or low-profile fences to limit vehicle access to sensitive habitat areas shall be included in the final plan and shall be of a design, materials and color palette that blends unobtrusively with the natural setting. No placement of rip-rap or other streambank alteration structures or measures are authorized ; and

B. Monitoring

One year, three years, five years, and ten years from the completion of final grading, Caltrans shall submit for the review and approval of the Executive Director, a landscape monitoring report, prepared by a licensed Landscape Architect or qualified Resource Specialist, that indicates whether the on-site landscaping is in conformance with the final revegetation plan approved pursuant to this Special Condition. The monitoring report shall include photographic documentation of plant species and plant coverage, a listing of the species that did not establish properly, and a listing of the plant species that were replanted to comply with these Special Conditions.

If the landscape monitoring report indicates that landscaping is not in conformance with, or has failed to meet the performance standards specified in the Erosion Control and Revegetation Plan approved pursuant to this permit, Caltrans shall submit a revised or supplemental revegetation plan for the review and approval of the Executive Director. The revised landscape plan must be prepared by a licensed Landscape Architect or a qualified Resource Specialist and shall specify measures to remediate those portions of the original plan that have failed or are not in conformance with the original approved plan. Further monitoring reports in accordance with the above requirements shall be required until the Executive Director is satisfied that the required cover, vigor, and permanent establishment of native vegetation required in the final plan authorized herein has been achieved.

C. Caltrans shall undertake development in accordance with the approved final plan. Any proposed changes to the approved final plan shall be reported to the Executive Director. No changes to the approved final plan shall occur without a Commission amendment to this coastal development permit unless the Executive Director determines that no amendment is legally required.

9. DRAINAGE STRUCTURE FINAL PLAN; MAINTENANCE RESPONSIBILITY

PRIOR TO COMMENCEMENT OF CONSTRUCTION, Caltrans shall submit for the review and approval of the Executive Director, a final plan for drainage structure management in any area of the project that is subject to CDP 1-06-022, including maintenance of hard structures and vegetated swales or similar landscape features designed to capture, slow, and/or treat stormwater runoff, protect coastal water quality, and control erosion. The final plan shall include a maintenance schedule and statement of responsibilities. With acceptance of this permit, Caltrans agrees that should any of the project's surface or subsurface drainage structures fail or result in erosion, Caltrans shall be responsible for any necessary repairs to the drainage system and restoration of the eroded area, and such repairs or restoration shall be timely undertaken such that increased erosion or other adverse affects do not occur. Should repairs or restoration become necessary, prior to the commencement of such repair or restoration work, Caltrans shall submit a repair and restoration plan to the Executive Director to determine if an amendment or new coastal development permit is required to authorize such work.

10. TEMPORARY PILES

No creosote treated piles shall be placed in any area of the project site where chemicals leaching from the piles may reach the waters of the Ten Mile River. Piles used to construct the temporary trestles shall be of concrete, steel, composite, untreated timber, or timber treated with a wood preservative approved by the Department of Fish and Game for use in marine waters. All temporary piles placed shall be pulled up and completely removed without digging them out or cutting them off at the mudline.

11. FINAL AUTHORIZATIONS; COMPLIANCE

PRIOR TO ISSUANCE OF CDP 1-06-022, Caltrans shall submit, for the review and approval of the Executive Director, complete copies of all final authorizations, reviews or permits for the proposed project that may be required by the California Department of Fish and Game, Regional Water Quality Control Board, U.S. Army Corp of Engineers, NOAA National Marine Fisheries, and U.S. Fish and Wildlife Service. Caltrans and its agents, employees, selected contractors and their subcontractors, agents, or employees shall at all times comply with all requirements, requests and mitigation measures from these state and federal agencies. Any change in the approved project that may be required by the above-stated agencies, or that may conflict with modifications or conditions imposed by the Commission in approving CDP 1-06-022 shall be submitted to the Executive Director to determine if the proposed change shall require an amendment to CDP 1-06-022 pursuant to the requirements of the Coastal Act and the California Code of Regulations. No changes to the approved project shall occur without a Commission certified amendment to CDP 1-06-022 unless the Executive Director determines that no amendment is legally required.

12. WATER QUALITY PROTECTION PLAN/SWPPP

A. PRIOR TO ISSUANCE OF CDP 1-06-022, Caltrans shall submit a copy of all Best Management Practices and other measures that will be implemented through specific contract measures to protect the quality of coastal waters that may be affected by project activities undertaken in the area subject to CDP 1-06-022, for the review and approval of the Executive Director. The submittal shall show in site-plan view, to scale, the location and limits of all authorized staging and storage areas, the approved offsite fueling area, the location and limits of the concrete washout areas, and any other feature the Executive Director determines applicable to the protection of coastal waters. The Water Quality Protection Plan shall also include specific measures to minimize discharges of contaminants from dewatering operations in any containment facility before the pumped water is discharged back into the Ten Mile River.

B. PRIOR to COMMENCEMENT OF CONSTRUCTION, Caltrans shall provide a copy of the Storm Water Pollution Prevention Plan (SWPPP) subsequently prepared by the contractor selected by Caltrans for the review and approval of the Executive Director, who shall determine whether the plan adequately incorporates the provisions of subparagraph A of this special condition. If the Executive Director determines that the SWPPP is not adequate for this purpose, project construction shall not commence until all changes reasonably required by the Executive Director have been made by the contractor.

C. Caltrans shall undertake development in accordance with the approved final plans. Any proposed changes to the approved final plans shall be reported to the Executive Director. No changes to the approved final plans shall occur without a Commission amendment to this coastal development permit unless the Executive Director determines that no amendment is legally required.

13. BIOLOGICAL MONITORING

In accepting the Commission's authorization of CDP 1-06-022, Caltrans accepts responsibility for ensuring compliance with all terms and conditions imposed by the Commission. All activities that are undertaken within the Ten Mile River channel, including the banks of the river and the environs of the site immediately adjacent to the top of the river banks, shall be subject to the requirements of this monitoring condition:

A. Qualifications, areas of duty of monitor:

Caltrans shall ensure that a qualified biologist (hereinafter "monitor") with significant field experience in fisheries ecology, including the rescue and release of trapped fish, as well as qualified to identify rare and sensitive plants that may occur within or adjacent to the project area, and who is approved by the Executive Director of the Commission as well as by the California Department of Fish and Game, NOAA National Marine Fisheries Service, and the U.S. Fish & Wildlife Service as applicable, shall observe project activities undertaken within the area subject to Specific PWP Project 1-06-01 adjacent to the Ten Mile River corridor during all activities with the potential to adversely affect sensitive habitat, species, or water quality, and shall monitor and ensure compliance with CDP 1-06-022 during such activities until the project is fully completed. If there is any question as to whether a specific project activity requires monitoring, the question shall be directed to the Executive Director for resolution; and

B. Education of on-site personnel:

Prior to commencement of construction, the monitor shall provide copies of, and brief all on-site personnel on, the requirements of all project authorizations, including requirements related to the protection of sensitive habitat and species, and of water quality, and shall provide additional copies and conduct additional briefings as new field personnel join the project, or as the monitor may determine to be additionally necessary, to ensure that all personnel understand and fully implement the applicable requirements; and

C. Non-compliance: First notification and required action by site supervisor:

The monitor shall immediately report any non-compliance with permit conditions to the Resident Engineer or other designated site supervisor and shall both log the incident in the monitoring notes and document the incident in writing with photographs. Within 24 hours the monitor shall provide an oral report of the incident to the Executive Director of the Coastal Commission followed by a written report detailing the incident. If the monitor observes any potentially adverse impacts to sensitive species, habitat, or water quality, the monitor shall immediately notify the Caltrans Resident Engineer ("site supervisor"), the Resident Engineer's designated substitute, or other site supervisor designated by Caltrans, and the site supervisor shall order the immediate cessation of any activities contributing to the reported non-compliance. If the site supervisor is uncertain about the compliance status of certain activities, the site supervisor shall nonetheless require cessation of such activities if the monitor identified any compliance concern about them. Resolution of any questions of intent or interpretation of any condition is

reserved for the Executive Director or the Coastal Commission pursuant to Standard Condition 3, above. Nothing in these requirements shall relieve the site supervisor from additionally monitoring the compliance with permit conditions of any party authorized to perform work on Caltrans' behalf and intervening to address or prevent non-compliance whether or not observed by the monitor; and

D. Further Notification and Remedial Action:

Immediately notifying the Resident Engineer or other designated site supervisor, the monitor shall additionally notify Caltrans' designated District 1 Environmental Unit Construction Liaison ("liaison") or the liaison's designated representative of any incident of non-compliance with the requirements of this permit. In addition, if for any reason the usual Caltrans site supervisor is unavailable, Caltrans shall ensure that the liaison has the authority to order the immediate cessation of any activity identified by the liaison or the monitor to be potentially non-compliant with the requirements of this project authorization, and Caltrans shall ensure that this authority is clearly understood by all parties undertaking any activities on the subject site. The designated site supervisor or liaison shall not allow the project activities of concern to re-commence until the state and regulatory agencies (which may include: California Department of Fish and Game, Regional Water Quality Control Board, Coastal Commission – North Coast District Office, NOAA National Marine Fisheries Service, U.S. Fish and Wildlife Service, Army Corps of Engineers) with applicable authority have been notified and have had an opportunity to advise Caltrans of any remedial action or additional project authorizations that may be necessary, and such project authorizations have been obtained and such remedial action has been fully implemented, to the satisfaction of the liaison, monitor, and the consulting agency or agencies; and

E. Monitor to verify SWPPP compliance reports:

The monitor shall evaluate for accuracy and completeness all Storm Water Prevention Plan (SWPPP) Best Management Practices compliance reports, typically prepared by the contractor chosen by Caltrans, and when the monitor is unavailable, the Caltrans site supervisor shall evaluate the reports for accuracy and completeness and the results shall be recorded in the engineer's daily records; and

F. Record-keeping, preservation, reporting:

The monitor-- and to the extent the liaison observes site conditions and activities, the liaison--- shall keep detailed field notes of all observations, including biological and physical environmental baseline observations daily, and shall document in writing with supporting photographs - any instance of potential non-compliance, including any instance of sediment or other discharge into the Ten Mile River corridor or other coastal waters, or areas that may drain to these waters, as shall the site supervisor. The monitor shall additionally record a professional estimate of any adverse impact on sensitive habitat, species or water quality that any instance of potential non-compliance imposes. The monitor and liaison shall individually retain copies of all notes, logs, and photographs, descriptions of any remedial actions taken in the event of non-compliance

or accident, and copies of the records and photographs of the monitoring biologists shall be permanently preserved and retained by Caltrans with the project records. The monitor and liaison shall additionally submit a complete copy of these materials to the Coastal Commission's North Coast District Office quarterly upon commencement of construction. The monitor and liaison shall additionally ensure and document that rainy season protective measures are fully in place to control erosion and thereby prevent the discharge of sediment to coastal waters, before the onset of rainy season annually October 15, and that the implemented measures perform adequately, until construction is completed; and

G. Additional Responsibility and Authority:

Nothing in these requirements shall relieve the Caltrans site supervisor or designated substitute, or the liaison, from additionally monitoring the compliance with project conditions of any party authorized to perform work on behalf of Caltrans within the area subject to CDP 1-06-022, and intervening to address or prevent non-compliance whether or not observed by the monitor. Caltrans shall ensure that a site supervisor is continuously available on-site or by telephone for the monitor's benefit, however if the site supervisor is unavailable for any reason, in accepting this project authorization, Caltrans shall authorize the liaison or the liaison's designated representative to order immediate cessation of any project activity that the monitor or liaison determine may be non-compliant with the requirements of the coastal development permit. In such cases, the responsibilities of the liaison shall be the same as the site supervisor pursuant to subparagraphs (c) and (d) above. Caltrans shall inform, in writing, all contractors working on the project of such designated, and at times delegated, authorities and ensure that all contractors understand and abide by the authority of the Caltrans site supervisor or his/her designated representative, the liaison, and the monitor.

14. SITE INSPECTIONS

Coastal commission staff, and other agency staff that the Coastal Commission staff may coordinate site visitation with, shall be authorized to enter the site at any time to observe project activities without prior notice. Caltrans shall ensure that a minimum of two sets of protective gear are available on site at all times (including hard hats, goggles, safety vests, and high visibility rain gear, etc., such as Caltrans deems necessary for the safety of site visitors). If activities are underway that could cause a hazard to site visitors, the site supervisor or designee shall require that these activities be temporarily suspended as soon as practicable, for a reasonable amount of time to allow safe site inspection by Commission and agency staff, and the site supervisor or designee shall accompany staff during such site visits.

15. AUTHORIZED DEVELOPMENT ONLY; PERMIT AMENDMENT REQUIRED

All activities associated with the development authorized herein shall be undertaken in continual conformance with the approved project description and with the terms and conditions of approval of the permit. Any proposed changes to the approved project shall

be reported to the Executive Director. No changes to the approved project shall occur without a Coastal Commission-approved amendment to the coastal development permit, unless the Executive Director determines that no amendment is legally required.

16. PROTECTION OF FUTURE PUBLIC ACCESS

A. By acceptance of Commission approval of CDP 1-06-022, Caltrans acknowledges and agrees: (i) to provide permanent public access for pedestrian and bicycle use on the Ten Mile River Bridge as generally depicted on Exhibit 1A attached hereto; (ii) the 5-ft-wide pedestrian corridor on the bridge deck shall remain available for public access use as an important link in the California Coastal Trail and shall be maintained for safe pedestrian and handicapped access through separation from the traffic side of the bridge by means of a crash-test-approved guard rail (ST-10 or equivalent); (iii) the 6-ft.-wide paved shoulders shall be maintained for the protection and continued use of bicyclists; and (iv) signage shall be installed at each end of the bridge that identifies for the public the availability of the 5-ft-wide pedestrian corridor on the bridge deck for public access use.

B. PRIOR TO ANY CONVEYANCE OF THE PROPERTY THAT IS THE SUBJECT OF THIS PROJECT APPROVAL, Caltrans shall execute and record a deed restriction, in a form and content acceptable to the Executive Director, that provides permanent public access for pedestrian and bicycle use on the Ten Mile River Bridge as generally depicted on Exhibit 1A attached hereto. The 5-ft.-wide pedestrian corridor on the bridge deck shall remain available as an important link in the California Coastal Trail and shall be maintained for safe pedestrian and handicapped access through separation from the traffic side of the bridge by means of a crash-test-approved guard rail (ST-10 or equivalent). In addition, the 6-ft.-wide paved shoulders shall not be reduced in the future to less than 4-ft.-wide for the protection and continued use of bicyclists.

C. WITHIN 90 DAYS OF COMMISSION APPROVAL OF CDP 1-06-022, Caltrans shall submit a written agreement, in a form and content acceptable to the Executive Director, incorporating all of the above terms of this condition.

17. UNIVERSAL (HANDICAPPED) ACCESS

A. PRIOR TO COMMENCEMENT OF CONSTRUCTION, Caltrans shall submit for the review and approval of the Executive Director revised plans that include continuous universal (handicapped) access that is Americans With Disability Act-compliant between the southern end of the ADA-compliant pedestrian corridor proposed for the bridge deck through the location of handicapped parking within the proposed parking turnout entrance approximately 445 feet south of the southerly end of the pedestrian corridor on the bridge or provide an alternative means of ADA compliant parking and access to the ADA-compliant pedestrian corridor on the bridge deck. An amendment to CDP 1-06-022 may be required unless the revisions to secure such alternative ADA compliance are determined to be *de minimis* by the Executive Director.

B. Caltrans shall undertake development in accordance with the approved final plans. Any proposed changes to the approved final plans shall be reported to the Executive Director. No changes to the approved final plans shall occur without a Commission amendment to this coastal development permit unless the Executive Director determines that no amendment is legally required.

18. FINAL RAIL DESIGN

WITHIN ONE YEAR OF COMMISSION APPROVAL OF CDP 1-06-022, Caltrans shall submit a complete application for an amendment of CDP 1-06-022 to incorporate a final Design Plan for bridge and guard rail or other barrier structures proposed for installation in any portion of the subject project subject to this coastal development permit. The Design Plan shall incorporate the lowest profile, most visually permeable design feasible for these features, consistent with safety requirements. The rail design shall incorporate graceful, arching elements where feasible, and shall not be painted unless the Commission subsequently approves an amendment for a specific painted finish and color. The final finish of surface elements shall otherwise be comprised either of non-reflective matte metal, or timber, or a combination of these, or an alternate material that may be deemed more attractive or less visually intrusive than these. The final design plan shall include a wildlife permeable design for off-bridge elements that is visually compatible with the final designs approved by the Commission pursuant to the amendment request(s).

19. PERMANENT SIGNAGE/SIGNAL/LIGHTING PLAN; LIMITATION ON FUTURE DEVELOPMENT

A. PRIOR TO COMMENCEMENT OF CONSTRUCTION, Caltrans shall submit a final, permanent signage, signal and lighting plan for the review and approval of the Executive Director. The signage, signal and lighting elements shall be of the minimum profile necessary and shall be limited only to those deemed essential for safety. No digital display "message" signs, "highway maintained by…" signs, other public relations signage, or solar power installations shall be allowed in the highly scenic Highway 1 corridor subject to this coastal development permit. The final plan shall specify the size, color, design, content and location of any sign within the area of the project that is subject to CDP 1-06-022. Permanent lighting is not authorized and would require an amendment to the coastal development permit.

No additional development including, but not limited to, widening, paving, placement of signs or other information displays, advertisements, lighting, digital or other data displays/advisories, solar installations, communications equipment, or maintenance facility improvements shall be undertaken within the area subject to CDP 1-06-022 without an amendment to CDP 1-06-022 for such additional development.

B. PRIOR TO COMMENCEMENT OF CONSTRUCTION, Caltrans shall submit, for the review and approval of the Executive Director, a Permanent Signage Plan, which shall specify the size, color, design, content, and placement of any sign or signal proposed for placement within the area of the proposed project that is subject to CDP 1-

06-022. No sign may be posted to exclude or limit the use by pedestrians or bicyclists of the trail and bicycle corridors on the bridge approved herein.

C. Caltrans shall undertake development in accordance with the approved final plans. Any proposed changes to the approved final plans shall be reported to the Executive Director. No changes to the approved final plans shall occur without a Commission amendment to this coastal development permit unless the Executive Director determines that no amendment is legally required.

20. IMPLEMENTATION OF WETLAND MITIGATION PLAN

All project activities shall be conducted in accordance with the Final Wetland Delineation and Supplemental Wetland Delineation Information dated August 2005, including mitigation, monitoring, and adaptive management described in the final plan, which shall be fully implemented in accordance with Caltrans' proposal.

21. FINAL DISPOSAL PLAN

PRIOR TO COMMENCEMENT OF CONSTRUCTION, Caltrans shall submit a Demolition, Staging, Storage, Fueling, and Debris/Excess Graded Material Disposal Plan for the review and approval of the Executive Director. The Plan shall identify designated disposal site(s) for all debris, wastes, or excess graded material that may be generated by the subject project. These materials may not be placed where they may come into contact with coastal waters, either directly or indirectly, or will displace agricultural lands, adversely affect sensitive species or habitat, or be visible from any public viewing area. Caltrans shall additionally provide evidence that all necessary permits, including coastal development permits, for such disposal, have been obtained not less than thirty (30) days prior to commencement of disposal, and shall provide copies of the applicable permits to the Executive Director. Caltrans shall maintain records of the final disposal of any debris, wastes, other materials or excessive graded soils generated during the construction of the project authorized herein and submit a copy of such records to the Executive Director annually, commencing on January 1 of the year following Commission approval of CDP 1-06-022, and a final report shall be submitted to the Executive Director within thirty (30) days of project completion.

22. AREA OF ARCHAEOLOGICAL SIGNIFICANCE

If excavation is proposed in an area of known or suspected cultural significance, a Native American Monitor shall be present during all ground-disturbing activities. If cultural remains are discovered, excavation or other ground disturbance shall cease and shall not re-commence until an archaeological plan has been reviewed and approved by the Executive Director if the Executive Director determines in writing that changes to the project or posed mitigation measures are *de minimis* in nature or scope. However, if such changes or measures are not deemed *de minimis* by the Executive Director, construction that may further affect the cultural remains may not recommence until after an amendment to this permit is approved by the Commission.

23. FINAL PLANS

A. PRIOR TO ISSUANCE OF COASTAL DEVELOPMENT PERMIT 1-06-022, Caltrans shall submit for the review and approval of the Executive Director two copies of final revised to-scale project plans, including two copies of reduced plans, showing the final proposal for 6-ft.-wide paved shoulders adjacent to the traffic lanes on the bridge, and a 5-ft.-wide Americans With Disabilities Act-compliant paved pedestrian corridor on the west side of the bridge, separated from the traffic side of the bridge by a crash-test-approved guard rail (final design to be determined by the Commission as otherwise set forth in these special conditions). No permanent lighting shall be included without an amendment to CDP 1-06-022 and this shall be noted on the final plans. The bridge rails, guard rails, crash barriers, and other similar features shall be reserved for final Commission design approval in a subsequent amendment to CDP 1-06-022 as provided in these special conditions.

B. Caltrans shall undertake development in accordance with the approved final plans. Any proposed changes to the approved final plans shall be reported to the Executive Director. No changes to the approved final plans shall occur without a Commission amendment to this coastal development permit unless the Executive Director determines that no amendment is legally required.

24. TIMING OF CONSTRUCTION

In accordance with Caltrans' proposal, no pile driving activities shall occur unless undertaken within a de-watered cofferdam except during the period between June 15 and October 31 of the first year of construction (commencing in 2007 according to Caltrans), and between September 15 and October 31 of subsequent years. Changes to windows for pile driving activities require an amendment to Coastal Development Permit 1-06-022 and the application for such an amendment must be accompanied by written evidence of approval by NOAA Fisheries, U.S. Fish & Wildlife Service, California Department of Fish and Game, and the Regional Water Quality Control Board.

25. ASSUMPTION OF RISK

A. By acceptance of Commission approval of CDP 1-06-022, Caltrans acknowledges and agrees: (i) that the site of the proposed Ten Mile Bridge project, including relocated elements of Highway One to the point of conformity with the existing highway, and the proposed new turnout area south of the bridge, may be subject to hazards from seismic events, liquefaction, storms, floods and erosion; (ii) to assume the risks to employees and assigns of Caltrans, including contractors and subcontractors and their officers, agents, and employees, and to the public utilizing the proposed project during and after construction, and to the property that is the subject of this permit of injury and/or damage from such hazards in connection with this permitted development; (iii) to unconditionally waive any claim of damage or liability against the Commission, its officers, agents, and employees for injury or damage from such hazards; and (iv) to indemnify and hold harmless the Commission, its officers, agents, and employees with respect to the Commission's approval of the project against any and all liability, claims,

demands, damages, costs (including costs and fees incurred in defense against such claims), expenses, and amounts paid in settlement arising from any injury or damage due to such hazards.

B. PRIOR TO ANY CONVEYANCE OF THE PROPERTY THAT IS THE SUBJECT OF THIS COASTAL DEVELOPMENT PERMIT APPROVAL, the applicant shall execute and record a deed restriction, in a form and content acceptable to the Executive Director: (1) indicating that, pursuant to the Commission's approval of this Coastal Development Permit as conditioned herein, the California Coastal Commission has authorized development on the subject property, subject to terms and conditions that restrict the use and enjoyment of that property (hereinafter referred to as the "Standard and Special Conditions"); and (2) imposing all Standard and Special Conditions of this Coastal Development Permit approval as covenants, conditions and restrictions on the use and enjoyment of the Property. The restriction shall include a legal description of the applicant's entire parcel or parcels. It shall also indicate that, in the event of an extinguishment or termination of the deed restriction for any reason, the Standard and Special Conditions of this permit shall continue to restrict the use and enjoyment of the subject property so long as either this Coastal Development Permit approval or the development it authorizes – or any part, modification, or amendment thereof – remains in existence on or with respect to the subject property.

C. WITHIN 90 DAYS OF COMMISSION APPROVAL OF CDP 1-06-022, Caltrans shall submit a written agreement, in a form and content acceptable to the Executive Director, incorporating all of the above terms of this condition.

26. <u>FUTURE DEBRIS EXPOSURE DUE TO RIVER SCOUR OR EROSION</u>

In accepting the Commission's approval of Coastal Development Permit 1-06-022, Caltrans agrees that if any subsurface debris, such as remnant pilings or portions of the abandoned bridge abutments or other components of the existing bridge that are not fully excavated and removed should become exposed in the future due to river scour or streambank erosion, Caltrans accepts responsibility for undertaking timely removal of such debris, which may pose hazards to coastal visitors, increase streambank erosion, or cause adverse visual impacts in the Highly Scenic river corridor. Removal of such debris shall require a new coastal development permit.

27. <u>FINAL PLAN FOR INCLUSION OF BIRD AND BAT NESTING/ROOSTING FEATURES ON BRIDGE</u>

Within one year following Commission approval of CDP 1-06-022, and by the time the final bridge rail design is submitted for final Commission review and approval, Caltrans shall submit for the Commission's review and approval a plan, including applicable revised project plans and/or construction drawings to scale, to incorporate bird and bat nesting and roosting habitat into the final bridge plan. The plan and supporting documents shall show features of the project that have been designed in consultation with a qualified biologist with expertise in the subject area, to ensure that the new bridge provides extensive and species-appropriate, permanent nesting and roosting habitat

designed to attract and support bridge-nesting or roosting birds and bats. The plans shall include an attached explanation prepared by the consulting biologist of the selection and extent of design features and identification of the target species for which the habitat features have been designed, with annotated citations of supporting research and reference literature.

II. FINDINGS

The Commission finds and declares as follows:

A. Background

The Commission previously reviewed the version of the proposed project that was submitted by the California Department of Transportation (Caltrans) in conditionally concurring with Consistency Certification CC-074-05 through the Federal Consistency review process, last November, 2005. The Commission conditioned its concurrence with Caltrans' Consistency Certification by requiring that the 8-ft-wide paved shoulders on the bridge be scaled down to provide for a 4-ft.-wide pedestrian corridor on each side of the bridge.

Caltrans has modified the project since that time in minor ways, but the most significant change is that Caltrans has revised the bridge design to include some, though not all, of the revisions previously required by the Commission.

Caltrans has evaluated that Commission's requirements and determined that the agency cannot revise the project to the extent that the Commission required while still meeting the safety standards Caltrans regards as critical to bridge safety. Caltrans asserts that the width of paved shoulders is directly related to a significant statistical reduction in traffic accidents (the greater the width, the fewer the accidents) and has submitted an excerpt from a study showing this correlation, attached as Exhibit 4A (1). In addition, a new analysis of accident statistics associated with the Ten Mile River Bridge has been provided to the Commission. The analysis produced by Caltrans Geometrics Program Engineer John Steele, is attached as Exhibit 4A(2). Caltrans had previously stated that the accident rate for the existing Ten Mile River Bridge over the past 5 years has been below the state average for similar structures. However, the new document shown in Exhibit 4A(2) indicates that this representation was apparently based on incorrect information. The correct conclusion according to Exhibit 4A(2) is that the existing bridge has a vehicular accident rate that is almost double the statewide average for such structures – lending support thereby to Caltrans assertions that the reduction of paved shoulder widths called for by the Commission should be reconsidered in light of this evidence, and in light of the accident rate reductions afforded generally by wider highway shoulders as shown in Exhibit 4A(1).

In addition to evidence that wider paved shoulders are statistically associated with reduced traffic accidents, Caltrans now indicates that the Ten Mile River Bridge has an accident rate approximately twice the average anticipated statewide for a structure of this type, lending emphasis to Caltrans assertions that the paved traffic shoulders cannot be

reduced to less than the now-proposed 6-ft.-wide shoulders. To substantiate the claim that the accident rate is higher than previously calculated, on May 17, 2006 Caltrans staff submitted the latest revised information provided by Caltrans geometrics engineer John Steele, via the Caltrans Intergovernmental Liaison Program Manager, Sheila Mone, and the Commission's Statewide Caltrans Liaison. The revised information submitted by Caltrans is attached hereto as Exhibit 4A(2).

For all of these reasons, Caltrans asserts that the paved shoulders on the bridge cannot be reduced to a width any narrower than six (6) feet wide adjacent to each of the two proposed traffic lanes, despite the requirements of the Commission in conditionally concurring with CC-074-05 (The adopted findings staff report and the transcript of the November 16, 2005 hearing are attached to the staff report for Friday June 16, 2006 Agenda Items 5a and 6a, as Exhibits 3A and 4A, respectively).

Thus, Caltrans proposes that in place of the previously-proposed 8-ft.-wide paved shoulders on the bridge, which the Commission required be divided between 4-ft.-wide paved traffic shoulders and 4-ft.-wide separated pedestrian walkways, a 6-ft.-wide paved shoulders would be constructed on each side of the traffic lanes (as explained in the staff notes above, Caltrans states that 6-ft.-wide shoulders are only proposed on the condition that the Commission approves the project quickly).

Although the Commission required revised plans to incorporate a 4-ft.-wide pedestrian corridor separated from traffic on each side of the new bridge, Caltrans proposes a compromise pedestrian design. Caltrans proposes to construct a corridor on the west side of the bridge, separated from traffic by a guard rail (ST-10, 31 inches high, 18 inches wide) to accommodate pedestrians. The outer rail would be the metal "picket" style of railing that Caltrans installed on the Noyo Bridge in downtown Fort Bragg. That rail is 54 inches high.

The east side of the bridge would be the ST-20 type of guard rail with horizontal bars to the 54-inch level required for bicyclist safety according to Caltrans.

Caltrans proposes to accommodate not only pedestrians on the separated corridor, but has designed the pathway to a width of five (5) feet so that wheelchair access can be safely accommodated. The Commission only required a 4-ft.-wide corridor, but Caltrans asserts that a minimum width of five feet is essential to comply with Americans with Disability Act (ADA) requirements.[2]

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[2] The off-bridge elements of the project are reviewed in the staff report for June 16, 2006 Items Fri 5a and 6a, pursuant to Caltrans' request for Commission certification of a Public Works Plan for those areas of the project. The recommended findings in that staff report explain that the certified Mendocino County Local Coastal Program, which is the standard of review for the PWP, sets forth specific policies that require Caltrans to improve viewing areas in designated areas of the coast, such as the Ten Mile Bridge environs which are designated as Highly Scenic in the LCP. Additional policy requirements call for provision of handicapped parking access and connection of such parking to the subject viewing areas where such access can be accommodated. Caltrans is

The Commission also expressed concern about the visual impacts of the proposed bridge rail design during the November 2005 hearing on the subject project (the transcript of that hearing is attached to the staff report for June 16, 2006 agenda items Fri 5a & 6a as Exhibit 4A, and the adopted findings are attached in full to that report as Exhibit 3A).

Caltrans previously proposed to construct the bridge with two 12-ft.-wide traffic lanes flanked by two 8-ft.-wide paved shoulders, with an outside rail of the ST-20 type, which is comprised of a series of simple horizontal beams to a height of 54 inches (the height necessary to protect bicyclists sharing the shoulder, according to Caltrans).

Caltrans still proposes that type of rail on the east (upriver) side of the new bridge, which as presently proposed would not have a separated pedestrian corridor. The Commission did not respond favorably to the aesthetic properties of that rail design, and Caltrans has disposed of it on the west side of the bridge. The pedestrian outer rail does not have to meet crash test requirements so more design options are available. Also, where there is a pedestrian corridor on the outside, the paved traffic shoulder does not require a rail that is 54" high for bicyclists because with the adjacent pedestrian corridor west of the paved shoulder, a bicyclist would fall into the pedestrian lane only, and not over an outside bridge rail should an accident occur.

Future Commission review of bridge rail designs

The Commission convened a subcommittee (more about the subcommittee is explained in the staff report for June 16, 2006 agenda items Fri 5a and 6a) to investigate rail design options, and Caltrans has presented the current project proposal to the subcommittee. No recommendations have been made by the subcommittee to date, but Caltrans has agreed to continue to collaboratively explore design options through the subcommittee and subsequently return to the Commission for an amendment to CDP 1-06-022 (and the related Public Works Plan) to select a final design for the Ten Mile Bridge rails.

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also proposing a new parking turnout south of the proposed new bridge. The parking would be in a flat area that can be made compliant with ADA requirements for wheelchair accessible parking. Thus, Caltrans' proposal to ensure ADA compliance on the bridge helps the project achieve overall compliance with standards applicable to the various project components. Conversely, the separated pedestrian corridor now proposed by Caltrans on the bridge also renders the overall project compliant with LCP requirements that for viewing area improvements. As the staff report for the Ten Mile Bridge PWP states, however, the paved shoulder connecting the proposed parking turnout and the bridge sidewalk for pedestrians must *also* be made ADA-compliant or coastal visitors relying on wheelchairs would have no way to reach the bridge. If wheelchair-reliant coastal visitors cannot be accommodated, then the bridge deck corridor would not actually be accessible for wheelchair traffic, and the overall project description would not therefore be ADA-compliant (no ADA-compliant access appears feasible on the north side of the bridge as the project is presently proposed). If ADA compliance on the bridge were thus rendered moot, the pedestrian corridor could be designed to a narrower width than the presently-proposed five feet.

Caltrans developed a preferred alternative to place the new bridge on an upstream alignment to the east of the existing bridge (about 100 feet upstream as measured from the easternmost edge of each bridge, at the widest point of separation, with approximately 25 feet of clearspan between the two bridges before demolition and removal of the existing bridge).

The existing bridge is two-lane, approximately 31 feet wide (outside) with a 26-ft.-wide paved surface according to Caltrans. The proposed bridge will be about 1500 feet long and about 45 feet wide (outside to outside), with 36 feet of paved traffic area (including two 12-ft. traffic lanes and two 6-ft. shoulders), 18 inches of 31-inch-high inner guard rail (ST-10), and a 5-ft.-wide pedestrian corridor on the west side of the bridge (about 43 feet of paved surface). The outside pedestrian rail would be a 48-inch-high metal "picket" style. Caltrans states that the west side of the bridge will be "banked" higher than the east side to counter the centrifugal force of traffic traveling on a curve at high speed. This moderate increase in elevation on the west side will provide pedestrians with a slightly better view than if the trail were located on the east side of the bridge.

Other changes to the project description have been made by Caltrans, and these are mostly in response to issues raised by other state and federal agencies reviewing the project (none of the required permits or other authorizations of other state and federal agencies were finalized at the time of publication, except that State Lands Commission approved a land lease on January 6, 2006). These changes are set forth in revisions published by Caltrans on April 12, 2006, attached as Exhibit 7A.

Federal Consistency staff reported to North Coast District staff in handing off the project files and records after the Commission adopted the revised findings for CC-074-05 in March, 2006 that Caltrans had reported that the state and federal agencies seemed comfortable with the project as proposed but required more time to complete the preparation of final documents (mostly Biological Opinions). By April 2006, however, some remaining areas of disagreement emerged between Caltrans and other agencies.

The question of how to identify and fulfill adequate compensatory mitigation for residual adverse impacts to fisheries remained unresolved as well. That there would likely be lethal and sublethal affects on fish seems clear, though the degree of impact and means of detecting it remain unresolved, as does any plan to implement compensatory mitigation for the habitat of the affected fish species. For example, a fish passage improvement proposal suggested by Caltrans during the previous fall's Federal Consistency review, specifically for coho salmon mitigation, was later discovered to be proposed for a stream where coho are not present. Concerns about rare plants were finally resolved after protracted biological surveys and negotiations between Caltrans and other agencies in part because Caltrans revised the project description to avoid sensitive plant habitat. NOAA Fisheries and California Department of Fish and Game had other unresolved concerns about the project that remained unresolved as this report was being prepared, such as how to establish adequate performance standards to evaluate eelgrass regrowth in areas affected by the project (several versions of the eelgrass mitigation and monitoring

proposal have been published by Caltrans since Federal Consistency review was completed).

In addition, the complicated question of how best to apply the emerging science of hydroacoustic impact analysis to the evaluation and mitigation of fish kill that could be caused by sound pressure generated by pile driving in shallow waters has proven particularly challenging. As noted, one area of concern involves the monitoring and mitigation of hydroacoustic trauma that pile-driving activities may cause to nearby fish (Caltrans' hydroacoustic monitoring plan is attached as Exhibit 2A, and other related information is attached as Exhibits 8A through 10A). Four state and federally listed fish species inhabit the Ten Mile River in various life stages and during different seasons: coho and chinook salmon, northern California steelhead trout, and tidewater goby. Adverse impacts from sound pressure generated by pile-driving cannot be fully mitigated by the best available sound attenuation strategies, according to Caltrans. Thus some degree of lethal or sublethal effects are virtually certain to occur during pile-driving operations, despite deployment of the sound attenuation measures - but consensus about the severity of impacts, the allowable degree of impacts, and even how to parse the metrics of hydroacoustic measurements had not been fully reached during the short time available to undertake the present review on the expedited timeline Caltrans has requested.

To expedite Caltrans' urgent request for a June 2006 Commission hearing on final project approvals, staff decided to prepare final reports without waiting for other state and federal approvals as is usual. The special conditions reflect this, and provide for the subsequent incorporation of the standards and requirements eventually established by the other agencies (Caltrans indicates that final state and federal reviews should be completed by July 2006).

While the Federal Consistency review considered the project as a whole, CDP Application No. 1-06-022 is only for that portion of the project that is located within the area of the Commission's retained jurisdiction. As stated previously, separate staff reports have been prepared (also for the June 16, 2006 Commission agenda) for the components of the project that traverse the area that is presently subject to the certified Mendocino County LCP.

To the extent that the adopted findings for CC-074-05 apply to the area of the project in the Commission's retained jurisdiction, the previous findings are incorporated below and are shown in **Arial bold font** to distinguish that text.

Project Overview

Primary access to the bridge construction zone will use an existing dirt road on the south side of the river. A new access road and trestle (to allow movement across wetlands and the river) will be constructed north from the haul road east of the new bridge alignment. This will provide access for construction of the four landside bents, three in-water piers, upland and in-water cofferdams, northern abutment, and falsework for the bridge

superstructure. A second access road and trestle will be constructed north from the haul road on an alignment west of the existing bridge; this will provide access for construction of ground-level and above-ground debris containment structures required for bridge demolition. Earthwork and construction of an engineered fill slope is required at the south bluff to extend the realigned Hwy. 1 roadway to the bluff edge and construct the south abutment of the new bridge. Construction is scheduled to start in early 2006 and last for approximately three years.
(Caltrans now estimates that construction would likely commence in early 2007 and other referenced years will move to the future, accordingly)

Public Access and Recreation. The project will protect an existing informal public accessway to the shoreline located at the south end of the bridge and provides the only possible crossing of the California Coastal Trail (CCT) over the Ten Mile River. The Commission has conditioned its concurrence with CC-074-05 to state that the project would be consistent with the California Coastal Management Program (CCMP) if:

> ***The California Department of Transportation will submit to the California Coastal Commission, via coastal development permit applications, revised project plans for the Ten Mile River Bridge Replacement Project that provide for pedestrian pathways separated from vehicle traffic lanes and located within the eight-foot-wide shoulders on both sides of the bridge.***

Separated pedestrian pathways and widened shoulders for bicycle traffic will improve the safety of pedestrians and bicyclists crossing the river on this segment of the CCT and State Highway 1. The project will generate adverse but not significant impacts on public access due to Highway 1 construction delays and the temporary closure of the aforementioned informal accessway during demolition of the existing bridge. However, the replacement of the Ten Mile River Bridge with a new bridge that meets current seismic safety standards will ensure the long-term protection of public access and recreation provided by Highway 1 on this section of the Mendocino coast. If modified in accordance with the Commission's aforementioned conditional concurrence, the proposed project would be consistent with the public access and recreation policies of the CCMP (Coastal Act Sections 30210-14, 30220-21, and 30223).

Marine Resources. Construction and demolition activities for the project will occur in the river and within and adjacent to freshwater and brackish water wetlands found along the south bank of the river. The project includes new fill of coastal waters and is an allowable use under the "incidental public service" provision of Section 30233(a)(5) as the project is a limited expansion of an existing transportation facility necessary to maintain existing capacity. The project will not alter or affect the functional capacity of the Ten Mile River estuary and can be considered a "very minor

incidental public facility" based on previous Commission reviews of development in Section 30233(c) "priority wetlands."

The proposed project is the least environmentally damaging feasible alternative, in terms of its river crossing location, design features to minimize intrusions into wetland habitat, and construction methods and scheduling. Mitigation for permanent wetland impacts will occur on-site at a ratio of 3:1. The project will also generate temporary impacts on wetlands and eelgrass due to pilings, excavation, fill, ground mats, and shading. Mitigation for temporary impacts includes removal of all construction and demolition materials, implementation of revegetation and eelgrass mitigation plans, and restoration of all disturbed areas to pre-project conditions. Final success criteria for wetland and eelgrass restoration will not be met until a minimum three-year period with no remedial actions is achieved.

Temporary project impacts on coho and chinook salmon, northern California steelhead, and tidewater goby present in the Ten Mile River arise primarily from noise generated by pile driving for the new bridge piers, trestles, and framework. To minimize adverse effects on these species, the project includes seasonal restrictions and work windows for in-water pile-driving, requirements for use of cofferdams and double-walled isolation casings, monitoring of noise levels during pile driving, and implementation of an off-site coho salmon passage enhancement project. The proposed project is consistent with the wetlands and marine resources protection policies of the CCMP (Coastal Act Sections 30230 and 30233).
<u>Water Quality</u>. The proposed project contains design features to minimize water quality impacts from the completed project, and will include an up-to-date package of construction-related best management practices to ensure that the multi-year construction and demolition activities will not degrade water quality in the Ten Mile River. The project is consistent with the water policy of the CCMP (Section 30231 of the Coastal Act).

<u>Environmentally Sensitive Habitat</u>. The proposed project is designed to minimize significant adverse effects on environmentally sensitive habitat. No construction work or disturbance will occur in areas where federal- and state-endangered plant species occur, and nesting for migratory birds will be protected during bridge construction and demolition activities. The project revegetation plan includes provisions for replanting and restoring all disturbed areas to native vegetative cover, restoring all roadbed areas outside the new alignment of Hwy.1, and monitoring and remediation measures to ensure that environmentally sensitive habitats are restored to optimum, pre-project conditions in a timely manner. The project will protect environmentally sensitive habitat and is consistent with the environmentally sensitive habitat protection policy of the CCMP (Section 30240 of the Coastal Act).

Visual Resources. The proposed Ten Mile River bridge replacement project is located in a highly scenic coastal area and involves construction on a rural, two-lane section of Highway 1. The replacement bridge will be located immediately east of the existing bridge and is designed to mimic its height above the river, span length, and geometry. Visual design improvements include haunch girders to soften the more rectangular look of the existing bridge superstructure, and fewer bridge piers within the river and its south bank. The visual resource impacts from temporary relocation of transmission lines, cut and fill earthwork, and revegetation are adverse in the short-term but are not significant in the long term due to the restoration of disturbed areas that is incorporated into the project.

The wider bridge deck will make it more difficult to gaze directly down onto the Ten Mile River but the views that dominate the traveler's eyesight while crossing the bridge are primarily those in the middle ground and in the distance: the upper Ten Mile River Valley, the lower Ten Mile River and its estuary, the sand dunes of MacKerricher State Park, and the distant Pacific Ocean. Any adverse impact on visual resources from this perspective due to the wider bridge deck would be insignificant, but views from and towards the bridge would be adversely affected by the proposed installation of the industrial-looking version of the ST-20 rail. The Commission conditioned its concurrence with CC-074-05 to state that the project would be consistent with the CCMP if:

> ***The California Department of Transportation will submit to the California Coastal Commission, via coastal development permit applications, revised project plans for the Ten Mile River Bridge Replacement Project that provide for pedestrian pathways separated from vehicle traffic lanes and located within the eight-foot-wide shoulders on both sides of the bridge.***

This condition will limit the width of paved shoulders on the bridge available for vehicles and bicycles, and will help to maintain the scenic character of the two-lane bridge located in this rural area of the coastal zone. In addition, the requirement of separated pedestrian pathways on the bridge will necessitate a revised set of vehicle and pedestrian safety rails, and these rails should be more esthetically appealing than the originally proposed version of the ST-20 multi-use. The widening of paved shoulders along the Hwy.1 approaches to the proposed Ten Mile River bridge does not require significant landform alteration, massive vegetation removal, fill of wetlands, or construction in environmentally sensitive habitat. The visual appearance of the new roadway corridor will be different from that which exists today, but because the existing roadway is not physically constrained by the landscape through which it passes, any adverse effect from this new corridor would not be significant to the traveler. If modified in accordance with the Commission's aforementioned conditional concurrence, the proposed project would be consistent with the scenic and

visual resource policies of the CCMP (Coastal Act Sections 30251 and 30254).

Cultural Resources. The proposed project would occur primarily in a previously developed area along the Highway 1 corridor. With the results of cultural resources surveys conducted by Caltrans, Native American consultation, and Caltrans' commitment to stop work and undertake additional consultation should cultural resources be discovered during construction, the project does not hold the potential to adversely affect cultural resources. The project is consistent with the cultural and archaeological resource policy of the CCMP (Coastal Act Section 30244).

Agricultural Lands. The proposed project requires an expansion of Caltrans' right of way north and south of Ten Mile River in order to accommodate the eastward shift of Highway 1 as it aligns with the new Ten Mile River Bridge. To that end, Caltrans has initiated the process of purchasing the required strips of land from adjacent property owners. One property south of Ten Mile River encompasses coastal agricultural resources that are protected by a deed restriction from non-agricultural development. Due to the narrow strip of land to be obtained by Caltrans, its location immediately adjacent to Hwy.1, and the public service purpose of the project, the proposed conversion of approximately three acres of land from agricultural use to Hwy. 1 right-of-way would not significantly affect the agricultural viability of the remaining lands currently deed-restricted for agricultural uses. The project is consistent with the agricultural land protection policies of the CCMP (Coastal Act Sections 30241 and 30242).

2. General Setting

The Ten Mile River Bridge is located in one of the most scenic, rural, two-lane stretches of Highway 1 in Mendocino County. The lands on the east and west sides of the bridge are designated as Highly Scenic in the certified Mendocino County Local Coastal Program. Aerial photographs of the Ten Mile River Bridge and environs are available on the Coastal Records Project website:

http://www.californiacoastline.org/cgi-bin/image.cgi?image=11273

The Highway 1 corridor near the bridge has been formally identified as part of the California Coastal Trail, and during much of the year the bridge is the only safe means of crossing the Ten Mile River.

3. Project Description

The California Department of Transportation (Caltrans) is proposing to construct a replacement bridge for the State Highway 1 crossing of the Ten

Mile River, ten miles north of Fort Bragg in Mendocino County (Exhibits 1-4). The existing Ten Mile River Bridge is located approximately 1,600 feet from the Pacific Ocean. The reinforced concrete bridge was built in 1954 and is approximately 1,360 feet long and 26 feet wide, with two 12-foot lanes, 1-foot shoulders, and narrow raised curbs. The bridge superstructure consists of slab T-beam girder spans, with box girder spans over the river. The bridge is supported almost entirely on timber pile and spread footing foundations (two abutments and 20 bents and/or piers). It is the only bridge that provides access across Ten Mile River. State Hwy. 1 in the project area consists of one 12-foot lane in each direction with shoulder widths varying between 0.75 and 4.75 feet.

Caltrans has clarified the proposed project description to include the following: the proposed new public and maintenance turnout will be approximately the same size (2,841 square feet) as the existing turnout and will remain open to the public (the proposed new turnout had been previously proposed at 12,600 square feet); off-bridge transitions from 6-ft.-width to the point of conformity with the existing highway will be reduced in light of the shortened length necessary when reducing the shoulders from the previously proposed 8-ft.-width to the presently proposed 6-ft.-width on the bridge and at the beginning of the transition shoulder in each direction off the bridge. Caltrans transmitted a facsimile copy to staff of the final revised transition calculations for the paved shoulders now proposed on May 30, 2006, attached as Exhibit 7A(2), to the Public Works Plan/Project staff report, Agenda Items Fri 5a and 6a, June 16, 2006.

Caltrans has also clarified that although staging activities were originally proposed to be authorized anywhere within the right-of-way at the complete discretion of the contractor that will eventually be selected to undertake the project, the proposal is now revised to limit staging activities exclusively to the "mixing table" area (presently used for occasional maintenance activities, according to Caltrans), the proposed trestles, and the existing roadbed. No permanent lighting is presently proposed on or off of the bridge.

The proposed project arises from the need to provide a new earthquake-resistant bridge at this location and the determination by Caltrans that retrofitting the existing bridge was infeasible due the calculated vulnerability of a retrofitted bridge to collapse during a large flood event on Ten Mile River. Caltrans' *Project Report* for the Ten Mile River Bridge seismic replacement project states that:

> ***The controlling fault for this project site is the San Andreas Fault located approximately 17.4 kilometers* [10.8 miles] *west of the project site and is capable of generating a maximum credible earthquake of moment magnitude 8.0. The site is located within a peak bedrock acceleration zone of 0.4g. The underlying soils at the Ten Mile River Bridge are prone to liquefaction during moderate-to-strong ground shaking.***

> ***. . . The Office of Structure Design determined that the timber pile foundations are the controlling failure mechanism during a seismic event and that under liquefying conditions, the existing timber pile foundations cannot support the structure, making the bridge susceptible to collapse.***
>
> ***The risk of collapse is considered high, and there is no interim retrofit work that can be done to reduce structural deficiencies of the existing structure.***

Since the publication of the revised findings in March 10, 2006 a new earthquake fault has been identified along the Mendocino Coast, in the approximate location of the Ten Mile Bridge, according to the Commission's staff geologist. The fault, named the "Pacific Star Fault" has been reported as potentially capable of causing an earthquake of the same magnitude as the San Andreas Fault. Because the proposed bridge is engineered to withstand an 8.0 earthquake, the maximum Caltrans has determined could be generated in the area of the bridge from a San Andreas Fault earthquake, the bridge would be adequate to withstand the magnitude of earthquake that may be generated by the Pacific Star Fault. There is no evidence available at the time of publication of this report to indicate that a rupture zone associated with the fault would traverse the proposed bridge footprint.

The Ten Mile River Bridge does not meet current state and federal seismic guidelines for highway structures.

Caltrans states in its *Project Report* that it sponsored public meetings and provided opportunities for local organizations to participate in the development of the proposed project:

- **June 1996: Public open house on the original bridge retrofit design (this project alternative was abandoned in June 1998 due to flood hydraulic concerns).**
- **July 2002: Public information workshop to present bridge replacement alternatives A, B, C, 1, and 2.**
- **September 2004: Public information workshop to present Alternative C (the current project alternative).**
- **Friends of the Ten Mile River participated in the development of the 1999 *Project Study Report* and the *Project Report* for the proposed alternative. Their Chief Environmental Officer was a member of the Project Development Team.**

- **The Ten Mile Coastal Trail Foundation attended the January 1999 Project Development Team meeting and the July 2002 public workshop.**

- **The Northern California Trails Council participated in Project Development Team meetings in January 1999 and October 2002.**

The proposed Ten Mile River Bridge replacement project includes the following components (Exhibits 6-9 illustrate the project plan, Exhibits 10-11 illustrate typical roadway cross-sections, and Exhibits 12-14 illustrate the location of trestles and falsework):

1. **The project limits encompass a 1,410-foot-long southern approach along Hwy. 1, the proposed 1,488-foot-long bridge, a 650-foot-long northern approach along Hwy. 1, and access ways and construction zones on both sides of Hwy. 1 and on both sides of Ten Mile River. The construction zone across the river will extend from approximately 50 feet beyond the western edge of the existing bridge to 80 feet beyond the eastern edge of the new bridge.**

2. **The new bridge would be constructed on an approximately parallel, curved alignment east of the existing curved bridge at a variable offset of 50 to 63 feet. The proposed cast-in-place/prestressed concrete box girder bridge would have an eight-span superstructure (the bridge roadway) supported by three piers (the middle supports in the river), four bents (the middle supports on land), and two abutments (the bridge end supports). Each pier and bent would consist of two, six-foot-diameter cast-in-drilled-hole and/or cast-in-place-steel-shell pile columns approximately 132 feet in length. The height of the bridge roadway above the river would vary between 36 feet at mid-span and 39 feet at bridge ends, due to the sag vertical curve design of the bridge. The bridge would be approximately 1,488 feet long and 43** (now approximately 45) **feet wide, with two 12-foot-wide lanes and 8-foot-wide** (now 6-foot-wide) **shoulders** and a 5-foot-wide Coastal Trail pedestrian corridor on the west side only, with a 48-inch-high outer "picket" style pedestrian rail, and separated by traffic by an approximately 2.7-foot-high, 1.6-ft.-wide ST 10 type guard rail, and 54-inch-high ST-20 rail on the east side of the bridge as previously proposed. **Type ST-20 guardrails would be installed on the new bridge due to their 68% "see-through" capability. The ST-20 railing is 54 inches high and includes the four main rails and a bicycle rail. Metal beam guardrails will be installed at the approaches to and exits from the bridge.**

3. **The bridge shoulders would transition from 8 feet to 4 feet off the bridge along the new approaches, and would ultimately transition back down to the existing Hwy.1 shoulder widths (which range between 0.72 and 4.72 feet). In particular, the proposed shoulder**

widths on Hwy.1 (off the bridge) in each of the four geographical quadrants of the project are as follows:

i. **<u>NW quadrant</u>: 63-foot-long 8-foot shoulder with guardrail; 40-foot-long transition from 8-foot to 4-foot shoulder; 375-foot-long 4-foot shoulder; 100-foot-long transition from 4-foot to 2-foot shoulder; 66-foot-long transition from 2-foot to existing 0.75-foot shoulder.**

ii. **<u>NE quadrant</u>: 25-foot-long 8-foot shoulder with guardrail; 269-foot-long transition from 8-foot to 4-foot shoulder; 195-foot-long 4-foot shoulder; 100-foot-long transition from 4-foot to 2-foot shoulder; 66-foot-long transition from 2-foot to existing 0.72-foot shoulder.**

iii. **<u>SW quadrant</u>: 25-foot-long 8-foot shoulder with guardrail; 195-foot-long transition from 8-foot to 4-foot shoulder; 1,125-foot-long 4-foot shoulder; 66-foot-long transition to existing 4.72-foot shoulder.**

iv. **<u>SE quadrant</u>: 63-foot-long 8-foot shoulder with a 280-foot-long guardrail (due to adjacent slope); 40-foot-long transition from 8-foot to 4-foot shoulder; 1,243-foot-long 4-foot shoulder; 66-foot-long transition to existing 4.39-foot shoulder.**

(As noted above, Caltrans has submitted revised calculations for the off-bridge paved shoulder transitions based on a starting width of six feet, instead of eight feet. The transition lengths are reduced proportionately.)

Caltrans states that providing 8-foot shoulders on the new bridge will improve safety for bicyclists and pedestrians crossing the 1,488-foot-long bridge and provide space for disabled vehicles to pull out of the traffic lane. The shoulders will also provide adequate space for Caltrans maintenance vehicles to operate without the need to implement one-way traffic control on the bridge.

4. **A maintenance parking turnout on the west side of Hwy.1 approximately 330 feet south of the new bridge would be constructed to accommodate Caltrans maintenance vehicles and the general public. This feature would replace an existing maintenance turnout located immediately adjacent to the south end of the existing bridge on the west side of Hwy.1. Access from the proposed turnout to an existing informal trail at the south end of the existing bridge which leads to Ten Mile River and the shoreline at MacKerricher State Park would follow the old Hwy. 1 roadbed (pavement will be removed and the corridor re-vegetated).**

5. **Primary access to the bridge construction zone will use an existing dirt access road on the south side of the river; this former logging haul road exits the east side of Hwy.1 one-half mile south of the bridge and eventually passes under the bridge on its westward route towards the Pacific shoreline.**

6. **A new access road and trestle (to allow movement across wetlands and the river) will be constructed north from the haul road east of the new bridge alignment and will provide access for construction of the four landside bents, three in-water piers, upland and in-water cofferdams, northern abutment, and falsework for the bridge superstructure. Construction of the access road will include the use of landing mats and/or fill on geo-fabric placed over wetland habitat. The main trestle across the river will also have trestle extensions to and around the bent and pier locations, will sit 3.3 feet above the 100-year flood elevation of the river, and will rest on approximately 90 H-piles. The falsework will be supported by approximately 145 timber H-piles.**

7. **A second access road and trestle will be constructed north from the haul road on an alignment west of the existing bridge to provide access for construction of ground-level and above-ground debris containment structures required for bridge demolition. The trestle will rest on approximately 64 H-piles, and a containment platform under the portion of the bridge over the river will be constructed using approximately 34 H-piles. Piers supporting the existing bridge would be removed to a minimum depth of 2 feet below final grade of the riverbed.**

8. **Piers and bents for the new bridge will be constructed by driving steel shells deep into the earth until competent material is reached. Shells will be drilled out, fitted with reinforcing steel bars, filled with concrete, and capped. Concrete columns will be constructed upwards from the caps and connected to the bridge decking, consisting of steel-reinforced concrete and tensioning tendons supported by falsework.**

9. **Approximately 4,000 cu.yds. of material will be drilled out for the new piers and transferred to an offsite disposal location on private property in the coastal zone, approximately four miles south of the project site and 1.5 miles east of the hamlet of Cleone (Exhibit 15). Fill material will be placed and compacted on the site, erosion control measures will be implemented, and the site will be seeded with California native grasses. Prior to commencement of disposal, Caltrans will obtain a coastal development permit from Mendocino County for this activity in the non-appealable area of the coastal**

zone. Caltrans has since indicated that the eventually-selected contractor would be required to obtain the necessary CDP and that Caltrans will not join as an applicant for such permit. There is not sufficient information presently available to determine whether such permit could be considered appealable to the Commission as a major public works project, even if processed separately from the project the waste material arises from. Caltrans indicates that a number of coastal agricultural land holdings have been tentatively identified for this purpose, as noted in the Initial Study released by Caltrans on April 3, 2006. Caltrans has also stated that no particular location for waste disposal is binding on the contractor eventually selected because Caltrans is required to allow the contractor to exercise discretion in this area as a potential contract cost savings measure. However, the contractor must comply with all laws, including the requirement that a coastal development permit be obtained for disposal in the coastal zone.

10. **Barges and small boats (with drafts not to exceed 14 inches) may be used to transport construction materials and personnel between the construction site and a single river access point on the south bank of the river, approximately one-quarter mile east of the bridge and adjacent to the existing haul road near its intersection with Hwy.1.**

Caltrans notes that the use of a barge is unlikely due to the shallow depths of the river, but decided to keep this option in the project description to reserve it as an option for the eventually-selected contractor.

11. **An existing private gravel road located north of the Ten Mile River Bridge along the east side of Highway 1 will be realigned outside Caltrans' proposed eastward right-of-way expansion.**

12. **Overhead SBC telecommunication lines which cross the Ten Mile River immediately east of the existing bridge will be relocated into a conduit within the new bridge superstructure. In addition, the existing overhead SBC lines on the east side of Hwy.1 (extending 1,300 feet south of the existing bridge) will be placed underneath the relocated segments of Hwy.1 north and south of the new bridge. During project construction, the existing overhead SBC line will be temporarily re-routed to the west side of Hwy.1 at a location 1,300 feet south of the existing bridge. The aerial line will be strung along five temporary poles and three tree attachments until just south of the existing bridge. At this point the line will be placed in a gray plastic conduit and attached to the west side of the existing bridge using a series of metal brackets. North of the bridge, the temporary line will be buried along with a new permanent PGE power line on the west side of existing Hwy.1 for approximately 700 feet, whereupon the underground lines will cross under Hwy.1 to a new SBC cabinet at the northeast corner of the intersection of Hwy. 1 and Camp 2 Ten Mile Road.**

13. **Approximately 9,000 cu.yds. of cut and 9,000 cu.yds.** (Caltrans now proposes approximately 9,500 cu. yds. of cut and 9,500 cu. yds. of fill) **of fill are required to construct the realigned Hwy. 1 approaches, new abutments, and the private roadway realignment. Earthwork and construction of an engineered fill slope is required at the south bluff to extend the realigned roadway to the bluff edge and construct the south abutment of the new bridge. Cut and fill slopes will be constructed with 2:1 slopes to minimize landfill alteration and will avoid environmentally sensitive habitats, including wetlands. Any excess cut material will be disposed at the aforementioned off-site disposal area. Concrete and steel debris from the demolition of the existing bridge will be taken by the construction contractor to an approved disposal site for these materials (and possibly recycled).**

14. **Right-of-way acquisition of approximately 3.3 acres of private property along the east side of Hwy.1 north and south of the river is required. Caltrans will retain ownership of the abandoned Hwy.1 roadbeds north and south of the bridge and the existing bridge right-of-way. Caltrans will obtain temporary construction access easements on private property.**

15. **Construction staging and materials storage will occur within an existing one-quarter-mile-long highway turn-out (known as the "mixing table") within Caltrans right-of-way on the west side of Hwy.1 approximately one-third mile south of the bridge. The northern 130 feet of the turn-out will be reserved and maintained for public parking during the construction period; the balance of the turn-out may be fenced for security. Additional staging and materials storage may occur within the construction site** Caltrans has since clarified that except for the "mixing table" area, additional staging and materials storage within the project area would only take place on the old trestle and would not be authorized anywhere within the project area at the contractor's discretion as previously stated.

16. **Construction is scheduled to start in early 2006** (the start of construction would likely be in 2007 according to Caltrans' most recent estimates). **In-water work (i.e., pile driving for temporary trestles, falsework, and cofferdams) is limited in general to the period June 15 to October 31 of the first year of construction, and to the period September 15 to October 31 of subsequent years, as needed. Installation of permanent piles would occur year-round within the dewatered cofferdams. Once cofferdams and pilings are driven, bridge construction can occur year-round. Once the bridge deck is completed, the roadway will be re-aligned at the north and south approaches and demolition of the existing bridge will commence. Construction, demolition, and clean-up activities are currently**

scheduled for completion by the end of 2008; however, unforeseen circumstances could delay construction start and completion dates.

B. Public Coastal Access and Recreation

The Coastal Act provides the following:

Section 30210. In carrying out the requirement of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.

Section 30211. Development shall not interfere with the public's right of access to the sea where acquired through use or legislative authorization, including, but not limited to, the use of dry sand and rocky coastal beaches to the first line of terrestrial vegetation.

Section 30212.
(a) Public access from the nearest public roadway to the shoreline and along the coast shall be provided in new development projects except where:

(1) It is inconsistent with public safety, military security needs, or the protection of fragile coastal resources,
(2) Adequate access exists nearby, or,

. . .

(c) Nothing in this division shall restrict public access nor shall it excuse the performance of duties and responsibilities of public agencies which are required by Sections 66478.1 to 66478.14, inclusive, of the Government Code and by Section 4 of Article X of the California Constitution.

Section 30213. Lower cost visitor and recreational facilities shall be protected, encouraged, and, where feasible, provided. Developments providing public recreational opportunities are preferred . . . .

Section 30214.
(a) The public access policies of this article shall be implemented in a manner that takes into account the need to regulate the time, place, and manner of public access depending on the facts and circumstances in each case including, but not limited to, the following:

(1) Topographic and geologic site characteristics.
(2) The capacity of the site to sustain use and at what level of intensity.
(3) The appropriateness of limiting public access to the right to pass and repass depending on such factors as the fragility of the natural resources in the area and the proximity of the access area to adjacent residential uses.
(4) The need to provide for the management of access areas so as to protect the privacy of adjacent property owners and to protect the aesthetic values of the area by providing for the collection of litter.

(b) It is the intent of the Legislature that the public access policies of this article be carried out in a reasonable manner that considers the equities and that balances the rights of the individual property owner with the public's constitutional right of access pursuant to Section 4 of Article X of the California Constitution. Nothing in this section or any amendment thereto shall be construed as a limitation on the rights guaranteed to the public under Section 4 of Article X of the California Constitution . . .

Section 30220. Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.

Section 30221. Oceanfront land suitable for recreational use shall be protected for recreational use and development unless present and foreseeable future demand for public or commercial recreational activities that could be accommodated on the property is already adequately provided for in the area.

Section 30223. Upland areas necessary to support coastal recreational

As stated previously, Caltrans presently proposes to construct a 5-ft-wide pedestrian corridor on the proposed bridge, to accommodate the Coastal Trail and as much of the Commission's requirements in conditionally concurring with CC-074-05 as Caltrans believes feasible consistent with safety standards. The pedestrian corridor would be separated from the traffic lane by an ST-10 type of crash-test-approved guard rail. The outer pedestrian rail is proposed to be the metal "picket" type, 48 inches high, installed last year on the popular new Noyo River Bridge on Highway 1 where the road passes through downtown Fort Bragg.

The Commission previously required Caltrans to place a pedestrian walkway on each side of the bridge, and to divide the necessary area from the then-proposed 8-ft.-wide paved shoulders. This would leave approximately 4 feet of width for paved shoulders. Caltrans has explained why this option would not leave sufficient traffic shoulder from the

perspective of vehicle safety, and also that bicyclists would be safer on the constrained, relatively long bridge corridor if traveling on the 6-ft.-wide shoulders shoulders that Caltrans instead proposes to construct. Caltrans has submitted further evidence of the increased safety of wider bridge shoulders and of the increased accident statistics associated with the existing bridge that recent re-calculations of older data have now demonstrated (see Exhibit 4A). Caltrans has only provisionally proposed the 6-ft.-wide paved shoulders, however, as indicated in the recent Public Works Plan submittal noted above. The Commission finds it necessary, therefore, to require final plans pursuant to Special Condition 23 to ensure among other requirements that the proposed revisions are fully implemented.

The Commission finds the revised proposal to be an acceptable compromise between Caltrans' standards and the public access provisions of the Coastal Act, while achieving consistency with the key requirements of Chapter 3 applicable to public coastal access and recreation. The Coastal Trail on the bridge, safely designed with a guard rail protecting pedestrians from traffic, will provide a significant new public coastal access and recreation amenity, and will allow visitors to confidently approach the bridge deck to enjoy the scenic vistas of the beautiful Ten Mile River estuary and Pacific Coast from the elevated vantage point. Caltrans also proposes to construct a new parking turnout approximately 445 feet south of the southerly end of the bridge, replacing a similar turnout that is located immediately south of the existing bridge. Once the two features are linked via the proposed new road alignment that is part of the proposed Public Works Plan Caltrans has also submitted for Commission certification, public coastal views and access will be enhanced significantly by the proposed project.

Caltrans proposes to construct the bridge corridor in a manner that will be fully compliant with the requirements of the Americans with Disabilities Act. Caltrans states that the ADA requires that the pedestrian corridor on the bridge be a minimum of five feet in width, to accommodate wheelchair access. The Commission commends Caltrans for including universal access features for all coastal visitors, but finds that Caltrans must demonstrate that the final plans link the parking turnout with the bridge in such a manner that each element is ADA-compliant and that there is a continuous wheelchair accessible path between handicapped parking in the new parking turnout, along the highway corridor to the bridge, and on the bridge as well. The only location that handicapped parking could be accommodated according to Caltrans is at the proposed new parking turnout south of the bridge, on the west side of the highway. Without these features, Caltrans need not design the pedestrian corridor to the full five feet in width, which has increased the total bridge with somewhat over Caltrans' previous proposal, despite the 4-ft.-reduction in total paved shoulder width. The Commission finds it necessary, therefore, to require Special Condition 17 (Universal((Handicapped)) Access) to ensure that ADA-compliance is incorporated fully into all related components of the project so that the width required for ADA compliance of the bridge component is not rendered unusable for wheelchairs due to lack of ADA compliance in other components of the project.

The Commission further finds that if Caltrans cannot revise the plans to link the ADA-compliant bridge design with wheelchair accessible parking and an ADA-compliant

connection between the two features, then the bridge could more accurately be declared inaccessible for ADA purposes. In such case, the project plans could be revised to install a narrower pedestrian corridor on each side of the bridge, with ST-10 guard rail on the inner side and a 48-inch-high Noyo Style pedestrian picket rail on the outside of the eastern and western outer edges of the bridge. This alternative would conform more closely with the redesign that the Commission required in November 2005 (CC-074-05). Such redesign would also enable Caltrans to eliminate the ST-20 bike rail design that is otherwise necessary on the eastern side of the bridge and thereby substantially improve the aesthetically superior options for outer rail design necessary for pedestrians only.

In addition, though Caltrans presently indicates that the proposed bridge is being widened only to more safely accommodate existing traffic while accomplishing the increased seismic safety standards made possible only by a bridge replacement, there is always pressure to increase development intensities in scenic coastal areas. The Coastal Act requires, however, as stated below, that highly scenic rural sections of Highway 1, such as the Ten Mile Bridge stretch of the highway, remain a two-lane road. Thus, the Commission finds it necessary to require to impose Special Condition 16 (Protection of Future Public Access) for the protection of future public access to the public access amenities as presently proposed by Caltrans. Special Condition 16 requires Caltrans to record a deed restriction to protect permanent public access for pedestrian and bicycle use on the Ten Mile River Bridge, which will protect these amenities should conversion of any portion to use for motorized vehicles be contemplated in the future.

As further noted, Caltrans further proposes to include a crash-tested guard rail separating pedestrians and traffic as required by the Commission in November. This feature will significantly increase the safety of wheelchair-bound-visitors seeking out the bridge deck views, and the safety of any frail visitors, or visitors with small children – anyone unable to move quickly out of the path of an errant vehicle, or distracted by the views on the deck. The design Caltrans presently proposes will make the magnificent, sweeping coastal views available from the bridge deck available to a wide range of potential coastal visitors who might never otherwise venture onto the Coastal Trail traversing the deck, even if the 8-ft.-wide paved shoulders unseparated from traffic by a guardrail that were previously proposed, had been installed. Therefore, the Commission additionally finds that to preserve the important safety feature provided by the guard rail separating the Coastal Trail from the traffic corridor, which creates expanded opportunities for coastal access for a wider range of potential visitors with various mobility constraints, that Special Condition 16 is additionally necessary to require that the ST-10 guard rail or its equivalent remain in place in the future.

Conclusion

For all of the reasons set forth above, the Commission finds that the proposed project is consistent with the Chapter 3 policies of the Coastal Act concerning public coastal access and recreation, as conditioned.

The adopted findings for the Commission's conditional concurrence with CC-074-05 continue:

1. Introduction. The primary coastal access and recreation issues raised by the proposed project are: (1) protection of existing parking and coastal access opportunities at the south end of the bridge; (2) improved safety for pedestrians and bicyclists on the new bridge and along its northern and southern approaches; and (3) potential construction impacts on coastal access.

Caltrans' consistency certification provides the following analysis of public access and recreation at the project site and potential project effects on those resources:

> ***Coastal zone access within the project limits exists at two locations: Access Point 1, an approximate 22-meter (72-foot) long area at the immediate southern end of the existing bridge (west side), and Access Point 2, an approximate 400-meter (1,320-foot) long area located approximately 0.5 km (0.3 mile) south of the existing bridge (west side). Both parking areas are maintenance parking areas, but are often used by visitors to access the coast . . . .***
>
> ***Access Point (1):***
>
> ***Access Point 1 consists of a dirt Caltrans maintenance turnout and trail. The maintenance turnout is within Caltrans' right-of-way, and the trail passes through private property. Caltrans does not own or maintain the coastal access trail(s) within the project limits. Neither the turnout nor the trail(s) are identified as "official" coastal access points.***
>
> ***The current maintenance parking area and trail(s) would remain unchanged during construction. After the new bridge is complete, the current maintenance parking area would no longer be available for public use. There would, however, be a new area available for maintenance parking located approximately 115 meters (380 feet) south of the existing maintenance parking area, and would be 42 meters (138 feet) long and about 9 meters (30 feet) wide. The new maintenance parking area is within easy access to the "unofficial" coastal access trails.***
>
> ***Removal of the existing bridge would occur after the new bridge is complete, and would take approximately 6 months. During the removal, the trail(s) at Access Point 1 would not be available from Caltrans' right-of-way.***
>
> ***Access Point (2):***
>
> ***Access Point 2 consists of an approximately 400-m (1,320-foot) long dirt area used by Caltrans' maintenance personnel. The public often***

parks in this area and crosses Caltrans' right-of-way to unmarked trails on State Park land. Neither the parking area nor the trails are identified as "official" coastal access points.

During construction, a portion of this area would continue to be used by Caltrans' maintenance and as a construction equipment staging area. A 40-meter (132-foot) long section at the north end of this area would be available for public parking during the entire construction process. The remaining area may be fenced, temporarily, for safety and security. When the project is complete, the fence would be removed and the area would provide the same access opportunities as currently present.

2. <u>Parking and Shoreline Access</u>. Caltrans' *Project Report* for the Ten Mile River Bridge replacement project in part addresses coastal access issues and states that:

In the 1995 Department of Parks and Recreation (DPR) General Plan for MacKerricher State Park, DPR would like to formalize access into the Ten Mile River area to prevent erosion, wetland trampling, disruption of wildlife, and trespassing that now occurs. When possible, DPR would acquire an interest either by purchase or through an easement from a willing landowner south of the Ten Mile River Bridge for use of sufficient land to park 30 vehicles, including spaces for horse trailers and for visitors with disabilities. DPR will respect the wishes of the Department of Fish and Game not to provide formal boat access to the river, as that agency's intent is eventually to acquire the wetlands, including those on the south shore of the river, if the sellers are willing.

The U.S. Fish and Wildlife Service is concerned about public access to the northern portion of MacKerricher State Park land due to the presence of listed birds and plant species.

. . .

Mendocino County's LCP Policy 4.2-19 states the DPR shall develop a trail system, and in conjunction with Caltrans and property owners addressing access in the north end of MacKerricher State Park. The policy also states that a parking area shall be signed and improved by DPR utilizing the existing widened Caltrans right of way located on the west side of Highway 1 several hundred feet south of the Ten Mile River Bridge. A trail system shall be developed by DPR, in conjunction with Caltrans and private property owners, to connect this parking area via an existing trail entrance which is located at the southwest corner of the bridge.

Abutting the western edge of the existing Hwy.1 right-of-way are several parcels of private property and the northern reach of MacKerricher State Park, which encompasses nine miles of sandy beach, dunes, and rocky headlands between the Ten Mile River and Pudding Creek, at the north end of Fort Bragg. No formal public coastal accessways connect Hwy.1 and the shoreline in the project vicinity. The nearest public accessway to the shoreline is Seaside Creek Beach, 0.75 miles north of Ten Mile River. To the south, the nearest public access to the shoreline is at the main entrance to MacKerricher State Park, approximately five miles south of Ten Mile River. From this point, shoreline trails in the State Park follow an old logging haul road south to Pudding Creek and north to Ten Mile River.

However, as Caltrans notes in its consistency certification, an informal trail exists that leaves the north end of the existing unpaved maintenance turnout at the south end of the bridge, crosses over onto private property while dropping down the south bluff of Ten Mile River, and meets the old logging haul road (Exhibits 7 and 8). From this point, trail users follow the haul road out to the shoreline at MacKerricher State Park, follow the haul road upriver, or follow informal paths that lead to the south bank of Ten Mile River; the latter two locations are on private property. There are no signs on Hwy.1 approaching the turnout, or anywhere at the turnout, indicating the availability of shoreline access from this location.

Nevertheless, staff from the Commission, Caltrans, and California Department of Parks and Recreation (DPR) all confirmed that members of the public have long used the maintenance turnout at the south end of the bridge as a parking area and access point to reach the shoreline at the northern end of MacKerricher State Park. In addition, staff from these agencies confirm that members of the public also park at the much larger maintenance turnout one-third mile south of the existing bridge, walk up the highway shoulder to the smaller turnout at the bridge, and follow the aforementioned informal trails to the shoreline and Ten Mile River. Staff from DPR, U.S. Fish and Wildlife Service, and Caltrans also confirmed the sensitivity of natural resources at the northern end of MacKerricher State Park (including sand dunes, wetlands, endangered plants species, and endangered Western snowy plover habitat) and the potential conflicts between resource protection and public access that could arise from providing new formal access routes at this time between Hwy.1 and the shoreline in the area south of Ten Mile River.

As noted above, Caltrans proposes to eliminate the maintenance turnout at the south end of the existing bridge in concert with demolition of that bridge, which will occur after construction and opening of the replacement bridge. In conjunction with the realignment of the Hwy.1 approach to the south end of the new bridge, Caltrans will also construct a new unpaved maintenance turnout approximately 330 feet south of the existing turnout. In a July 8, 2005, letter to the Commission, Caltrans modified the subject

consistency certification by stating that the new turnout would be the approximate size of the existing turnout, would accommodate the same number of vehicles, and is located as close to the new bridge as possible given the need to achieve sight distance safety requirements. In addition, Caltrans made the following commitments:

- **The existing maintenance turnout would be landscaped and treated with erosion control measures, and would be kept open for walking/maintenance access.**

- **The proposed maintenance turnout would be used as maintenance parking/staging (long-term material storage would not occur).**

- **The area between the two maintenance turnouts (i.e., the abandoned Hwy.1 roadbed) would be landscaped (e.g., trees, contour grading, rocks, berms, wood fencing, etc.) to allow foot traffic only.**

- **There potential exists to expand the proposed maintenance turnout in the future to provide additional coastal access and/or provide additional maintenance material storage locations. Caltrans would coordinate with Coastal staff and other appropriate resource agencies prior to modifying or expanding either turnout.**

Caltrans has also committed that no fencing, signage, or landscaping elements will be installed to block or discourage members of the public from parking at this new turnout, walking up the abandoned highway corridor to the site of the existing turnout, and taking the informal trail leading down to the shoreline and Ten Mile River. (As noted previously in the Project Description section of this report, Caltrans will retain ownership of the abandoned highway corridor and the existing bridge right-of-way.) At the same time, no signage would be provided to either identify or encourage public use of the informal accessway up the vacated and revegetated highway corridor and down to the shoreline. The goals are to maintain the existing provision of public access to the shoreline at the southern end of the bridge, to not encourage an increase in the volume of access that could in turn adversely affect environmentally sensitive habitat in this area, and to not prejudice ongoing coastal access planning efforts by DPR by formalizing any existing informal accessways. As noted above, Caltrans has committed to coordinating with Commission staff and other appropriate resource agencies prior to any modification to or expansion of the new or existing turnout, including maintenance material storage or coastal access improvements. Lastly, in the April 2005 *Project Report* and in a meeting with Commission staff on August 15, 2005, Caltrans committed that it would cooperate with DPR and the Commission in future planning efforts for improving public access from Hwy.1 to the shoreline at the northern end of MacKerricher State Park.

3. <u>Pedestrian and Bicycle Access/Bridge and Highway Shoulder Widths</u>. Caltrans' *Project Report* for the Ten Mile River Bridge replacement project in part addresses provisions for pedestrian and bicycle access improvements along Hwy.1 and states that:

> ***Route 1 is heavily traveled by recreationists and tourists during the summer months and has been designated by the Legislature as part of the Pacific Coast Bike Route. The entire route has seasonally high bicycle traffic volumes during the summer months.***
>
> . . .
>
> ***On October 2, 2002, Senate Bill 908 was signed into law by Governor Davis. The bill requires the Coastal Conservancy (CC) in conjunction with various State agencies to develop and provide to the Legislature by January 31, 2003, a plan for a coastal trail from Oregon to Mexico to afford visitors views of some of the most majestic vistas in California. The bill requires the trail to be completed by January 31, 2008, providing budgeted funding materializes. Reconstruction and rehabilitation strategies involving Route 1 are to incorporate provisions for accommodating the coastal trail where feasible.***
>
> ***. . . Caltrans has evaluated segments of the Pacific Coast Bike Route to prioritize improvement locations. The project will provide 1.2-m (4-foot) paved shoulders, improving safety for bicyclists and pedestrians.***

On January 31, 2003, the State Coastal Conservancy published *Completing the California Coastal Trail*, which provides a strategic blueprint for implementing the California Coastal Trail. While the Highway 1 bridge across the Ten Mile River is the only bridged crossing of the river for bicyclists and pedestrians following the Coastal Trail, the mouth of the river can occasionally be waded across during the summer. For all practical purposes, however, the proposed replacement Hwy.1 bridge will continue to serve as the sole crossing of Ten Mile River for users of the Coastal Trail.

As noted previously in this report, the existing paved shoulder widths on Hwy.1 within the project limit vary between 0.72 and 4.72 feet; the existing Ten Mile River bridge has one-foot-wide shoulders. Caltrans is proposing 8-foot shoulders on the new bridge, shoulders ranging between 8 and 4 feet along Hwy.1 south of the bridge, and shoulders ranging between 8 and 0.7 feet along Hwy.1 north of the bridge. Caltrans states that these shoulder widths will allow for pedestrians and bicyclists to more safely traverse the Hwy.1 crossing of Ten Mile River as compared to current conditions and will serve as an improved link in the Coastal Trail.

The proposed bridge and highway shoulder widths in the project area have generated extensive discussions between Caltrans and the Commission staff over how to best balance the public access and visual resources policies of the Coastal Act (including comments sent to the Commission staff by the public via mail (Exhibits 16 and 17) and telephone calls). Currently, the Ten Mile River bridge includes one-foot-wide shoulders and the shoulders along the north and south approaches to the bridge in the project area vary between 0.7 and 4.7 feet. Caltrans initially proposed the following shoulder widths and lengths: (1) extending the eight-foot-wide bridge shoulders approximately 100 feet to the north and south of the bridge; (2) next constructing approximately 190-foot-long transitions from eight- to four-feet wide shoulders north and south of the bridge; (3) next constructing four-foot-wide shoulders for 200 feet north of the bridge and 980 feet south of the bridge; and (4) constructing 195-foot-long (north) and 66-foot-long (south) transitions from four-foot-wide shoulders to existing shoulder widths.

Caltrans stated that these shoulder dimensions were necessary at Ten Mile River bridge and along the north and south approaches on Hwy.1 due to existing vehicle traffic levels, current highway and bridge safety design guidelines, the need to improve safety for bicyclists and pedestrians crossing the 1,488-foot-long bridge, the need to provide safe space out of traffic lanes for disabled vehicles, and the need to provide adequate space for Caltrans maintenance vehicles to park and/or operate without the need to implement one-way traffic control on the bridge. The Commission staff noted that the introduction of such wide shoulders along this stretch of rural Hwy.1 did not appear to be supported by the below-average accident and collision data for this Hwy.1 segment and the adjacent Hwy.1/Camp 2 Ten Mile Road intersection just north of the bridge. However, the Commission staff acknowledged that the essential lack of shoulders on the existing bridge does create a significant safety hazard for bicyclists and pedestrians crossing the bridge, and does not provide a safe pullover area for disabled vehicles, emergency vehicles, or Caltrans maintenance vehicles.

The Commission staff also questioned the need for the proposed lengths of eight-foot-wide shoulders and of the transition lengths between eight- and four-foot-wide shoulders along Hwy.1 north and south of the bridge. While Caltrans continued to argue for the proposed shoulder widths and lengths based on design guidelines, the Commission staff argued that the supposed public access benefits that would arise from the introduction of paved shoulders in excess of four feet in width into a stretch of Hwy.1 where existing shoulder widths rarely reach four feet (and in most areas are significantly less than four feet) would be inconsequential, but that potential visual resource impacts from these shoulders could be significant (see Section E of this report). As a result, Caltrans agreed to modify the proposed project by reducing the lengths of the eight-foot-wide shoulders

off the bridge and the lengths of shoulder transitions between eight and four feet on the bridge approaches, as follows:

Hwy.1 North of Bridge	Original Length	Proposed Length	
		NE Exit	NW Approach
8-foot-wide shoulder	96 ft.	25 ft	63 ft
8- to 4-foot-wide transition shoulder	185 ft	195 ft	40 ft

Hwy.1 South of Bridge	Original Length	Proposed Length	
		SW Exit	SE Approach
8-foot-wide shoulder	100 ft	25 ft	63 ft
8- to 4-foot-wide transition shoulder	194 ft	195 ft	40 ft

The Commission notes the significant reductions agreed to by Caltrans (and incorporated into its consistency certification) in the length of eight-foot shoulders off the bridge in all four quadrants, and in the length of the eight- to four-foot transition shoulders on the bridge approaches (SE and NW quadrants, above). Caltrans justified the need to maintain longer eight-foot-wide shoulders and eight-to-four-foot-wide shoulder transitions coming off the bridge in both directions due to the overall narrowing of the improved right-of-way as one exits the bridge (as compared to the widening of the paved right-of-way when entering the bridge) and the rising left hand curves as vehicles exit the bridge in north and southbound directions. The proposed project as modified will continue to provide significant improvements (e.g., wider paved shoulders on the new bridge bicyclists and pedestrian) to public access along this stretch of Hwy.1 and at the same time will reduce the potential for adverse effects on visual resources from the widening of the paved roadway on both approaches to the new Ten Mile River bridge.

Staff has received information from Caltrans explaining the agency's view of the improved safety provided by widened bridge shoulders. The transmittal is attached as Exhibit 4A(1), and a chart prepared by Caltrans that indicates that the widening of shoulders is associated with a significant decrease in traffic accidents. Caltrans geometrics engineer John Steele of Caltrans headquarters engineering staff has previously

informed Commission staff that he must determine the suitability of all design "exceptions" (variations from the published standards in the engineering specifications references that are often requested for context sensitive design purposes) for projects that have Federal Highways funding. Mr. Steele determines whether such exceptions will be approved, as the Federal Highways Administration has delegated such review authority to Caltrans. In the case of the Ten Mile Bridge project, Mr. Steele has determined that he will only support a reduction from the previously proposed 8-ft.-wide paved shoulders on (and transitioning from) the proposed bridge, to a minimum of 6-ft.-wide paved shoulders.

The Commission staff also inquired about feasible alternatives for traffic lane/shoulder separation markers that could be placed on the bridge as a means to alert vehicle drivers of the lane/shoulder boundary. Caltrans will install an extra-thick layer of white thermoplastic paint, thick enough to let drivers know when they are crossing over it into the shoulder yet not too thick as to be a road hazard to vehicles or bicycles. The well known "bots dots" lane dividers are not preferred by bicyclists and require extra maintenance activity, and "rumble strips" (parallel grooves cut into the roadbed that trigger strong and loud vibrations when vehicle tires roll over them) are only feasible on asphalt surfaces and not on concrete bridge decks such as that proposed for the Ten Mile River bridge.

During its evaluation of the proposed project, the Commission staff inquired of Caltrans about the feasibility of providing a separated pedestrian pathway on the new bridge in order to further improve public access at the Coastal Trail crossing of Ten Mile River. Such a feature was included on the Noyo River bridge replacement project in Fort Bragg (CDP 1-98-100), and was referenced in communications from the public to the Commission staff during its analysis of the subject Ten Mile River bridge consistency certification. Caltrans responded that the Noyo River bridge is located in a more urban and developed location with a significant volume of historic, current, and expected future pedestrian and bicycle traffic that justified the inclusion of a separated pedestrian pathway. Caltrans stated that at the rural location of Ten Mile River bridge there is presently "an insufficient level of pedestrian and bicycle traffic at this location to justify construction of a separated pedestrian and bicycle pathway on the bridge." Caltrans cited a finding from the *Pacific Coast Bike Route Study* (Redwood Community Action Agency, March 2003) which:

> **. . . included counts taken at various locations, including Seaside Beach – which is approximately one mile north of Ten Mile Bridge. The 12 hour count was taken during Labor Day weekend, resulting in a count of eight bicyclists and zero pedestrians.**

Caltrans also noted the below-average vehicle accident rate at Ten Mile River bridge and that no significant adverse safety conflicts between

vehicles and pedestrians/bicyclists currently exist at the bridge or along its approaches.

While the Commission staff acknowledged Caltrans' characterization of present conditions at Ten Mile River bridge, the staff nevertheless believed that potential future increases in vehicle, bicycle, and pedestrian traffic along this stretch of Hwy.1 and the Coastal Trail justified the incorporation by Caltrans of the potential future need for pedestrian and/or bicycle safety improvements into the Ten Mile River bridge replacement project. Caltrans subsequently agreed to add the following language to its consistency certification:

Ten Mile Bridge Replacement Project: Bicycle and Pedestrian Use Language

The proposed project includes paved, eight-foot-wide shoulders on the bridge, a substantial improvement to the one foot wide shoulders that currently exist on the bridge. The new shoulder widths will provide room for disabled automobiles, Caltrans maintenance vehicles, and an expanded margin of safety for bicyclists and pedestrians to cross the Ten Mile River; the shoulder will also serve as the river crossing route of the California Coastal Trail.

The Pacific Coast Bike Route Study (March, 2003—Redwood Community Action Agency) included counts taken at various locations, including Seaside Beach—which is approximately one mile north of Ten Mile Bridge. The 12 hour count was taken during Labor Day weekend, resulting in a count of eight bicyclists and zero pedestrians.

Presently, there is an insufficient level of pedestrian and bicycle traffic at this location to justify the construction of a separated pedestrian and bicycle pathway on the bridge. The paved shoulder on and adjacent to the bridge will have a painted symbol showing the shoulder can be used for bicycle travel. The shoulder will also be separated by a painted, raised thermoplastic white stripe, alerting drivers if they stray from the traffic lanes. A pedestrian/bicycle advisory sign and a California Coastal Trail sign will be placed at the north and southbound approaches of the new bridge. The sign text, location, size, and color will be consistent with Caltrans' statewide standards, and subject to review and approval by the Coastal Commission's Executive Director.

No later than five years after and again at ten years after the new bridge is completed, Caltrans will conduct a pedestrian and bicycle count, and interview appropriate user groups (including Coastwalk) to receive input on the pedestrian and bicycle use of the bridge. Caltrans will then provide a written analysis to the Commission's Executive Director on the results of these efforts. The analysis will include a comparison

of pre- and post-bridge construction pedestrian and bicycle count data, as well as post construction user experiences, and a discussion of the potential need for pedestrian and/or bicycle bridge safety improvements. Data from the 2003 Pacific Coast Bike Route Study would serve as the baseline data for future counts.

If the level of pedestrian and/or bicycle traffic increases substantially, or if a substantiated pedestrian and/or bicycle safety concern arises on the bridge, Caltrans will complete an analysis within six months of Caltrans being informed of the substantiated concern. Depending on the concerns identified, the analysis will discuss options for improvements to better address safety issues and protect public access. The analysis will assess a range of appropriate and feasible pedestrian and bicycle improvement alternatives, and may include a separate or cantilevered pedestrian and/or bicycle pathway.

In the event, as described above, an immediate analysis is required, Caltrans will coordinate with Commission staff to ensure safe pedestrian and bicycle access on the new bridge is maintained. This coordination will also help to identify whether changes or amendments to this consistency certification and/or future coastal development permits may be necessary.

However, the Commission determined at its November 16, 2005, public hearing for CC-074-05 that the aforementioned commitments by Caltrans were insufficient and that in order to find the proposed bridge replacement project consistent with the public access and recreation policies of the Coastal Act, Caltrans would need to provide pedestrian pathways separated from vehicle traffic lanes and located within the eight-foot-wide shoulders on both sides of the bridge (Exhibit 28, excerpts from reporter's transcript of proceedings). The Commission emphasized the critical importance of providing a safe and pedestrian-friendly route for the California Coastal Trail (CCT) on the Ten Mile River Bridge. The Commission also determined that the proposed eight-foot-wide vehicle shoulders on the bridge are out of scale for this scenic rural road and that this segment of Highway 1 – based on the available traffic and accident statistics – does not appear to be a public safety hazard. The Commission noted the Mendocino County LCP policy (while not the standard of review for federal consistency certifications, but rather a source of background information for the Commission) calls for paved, four-foot wide shoulders along Highway 1 (where environmentally feasible). The Commission also noted exemptions that Caltrans has made to its shoulder "standards" at other state highway locations. The Commission further determined that designing and incorporating provisions for public access at this stage of the project was preferable to future retrofitting of the bridge, particularly given the current lack of safe pedestrian access across the bridge and the use of the bridge as the most obvious route of the CCT across Ten Mile

River. In addition, the Commission noted that they will be reviewing this project under a coastal development permit application in the future and will expect to see greater detail as to how the project will be modified to be consistent with the CCMP at that time and through that process.

For these reasons, the Commission determined that in order for the proposed Ten Mile River Bridge replacement project to be found consistent with the public access and recreation policies of the CCMP, the project would need to be modified as follows:

> ***The California Department of Transportation will submit to the California Coastal Commission, via coastal development permit applications, revised project plans for the Ten Mile River Bridge Replacement Project that provide for pedestrian pathways separated from vehicle traffic lanes and located within the eight-foot-wide shoulders on both sides of the bridge.***

The project also raises the issue of the potential for the Ten Mile River bridge replacement project – in particular, the proposed eight foot shoulders on and off the bridge – to be viewed as a precedent for future Caltrans Hwy.1 improvement projects in the coastal zone. The proposed Ten Mile River bridge replacement project is based on a unique set of site-specific environmental and infrastructure characteristics, and the Commission is evaluating the project elements for consistency with the policies of the Coastal Act. For instance, the topographic relief, distribution of vegetation types, and views to the shoreline at the Ten Mile River bridge project area are notably different from those present along Hwy.1 crossings of Noyo River and Greenwood Creek to the south. Separated pedestrian pathways, eight-foot-wide shoulders, and four lanes of vehicle traffic are appropriate at the urban location of Noyo Creek bridge. The expansive and rolling landscape at the rural location of Ten Mile River bridge requires minimal grading and landscape alteration to construct the proposed replacement bridge with widened shoulders and separated pedestrian pathways on the bridge. In contrast, bridge construction at the Hwy.1 crossing of Greenwood Creek is complicated in part by more severe topography, the presence of different vegetation and wetland types, different viewshed characteristics, and its close proximity to the village of Elk. Replacement bridge project elements appropriate and consistent with the Coastal Act at one location on Hwy.1 in Mendocino County may be inconsistent with coastal protection policies at other locations. As a result, the Commission will continue to examine each Hwy.1 improvement project on a case-by-case basis, using a project's site-specific characteristics, to determine whether proposed Hwy.1 improvements are consistent with the Coastal Act. At a meeting between Caltrans and Commission staff on August 15, 2005, Caltrans acknowledged this Commission process and committed that Commission action on the

Ten Mile River bridge replacement project would not be cited or used by Caltrans as a precedent for any future Hwy.1 projects in the coastal zone.

4. Construction Impacts. Caltrans' *Project Report* for the Ten Mile River Bridge replacement project in part addresses Hwy.1 traffic management during the three-year-long construction period and states that:

> ***Standard traffic control features (flaggers, COZEEP* [Construction Zone Enforcement Enhancement Program, a statewide master agreement between Caltrans and the California Highway Patrol, whereby Caltrans pays the CHP for furnishing officers and cars for use in construction zones], *etc.), lane-closure requirements, changeable message signs, and public awareness measures have been incorporated in the project cost estimate.***
>
> ***It is anticipated that temporary traffic signals will not be needed and the work can be accomplished with one-way reversible traffic control conforming to Caltrans Standard Plan T-13. Traffic may need to be stopped for periods not to exceed 30 minutes. Bicyclists and pedestrians shall be accommodated through the work zone.***
>
> ***Access to side roads and residences would be maintained at all times.***
>
> ***Where available, a minimum of one 3.6-m (12-foot) lane and 1.2-m (4-foot) shoulder would remain open to traffic at all times. Otherwise, a minimum of one 3.0-m (10-foot) and 0.6-m (2-foot) shoulder shall be provided.***

Caltrans estimates that due to the size and complexity of the bridge construction and demolition work, and the environmental work window restrictions due to the presence of endangered species in Ten Mile River, the project is expected to take approximately 758 working days (or 1,100 calendar days) to complete, without accounting for weather and other unexpected construction delays. Caltrans expects that field construction would start in early 2006 (now 2007) **and be completed by the end of 2008** (now 2009), **but that delays could extend project completion into 2009** (2010). **As a result, construction activities will occur year-round for several years at Ten Mile River and will generate some level of adverse effect on vehicle, bicyclist, and pedestrian access on this stretch of Hwy.1, primarily in the form of traffic delays when construction work requires the closure of a lane of traffic.**

There are no alternative crossings of the Ten Mile River that would allow the public to avoid the construction zone, and there are no reasonable construction/demolition scheduling alternatives that avoid the peak summer recreation season. The potential adverse impacts on public access and recreation along this section of the Mendocino County coast

should the existing bridge collapse or be closed due to earthquake damage are far more significant than the temporary effects (albeit over a three-year time period) due to construction and demolition delays. In addition, the closure of the informal accessway from the southern end of the existing bridge down to the shoreline during the demolition of the existing bridge is unavoidable in order to protect public safety. However, demolition and trail closure will occur between October and February due to environmental restrictions and as a result, significant adverse effects on public access during the peak summertime recreational use period will be avoided.

5. **Conclusion**(from adopted findings for CC-074-5). **The Commission finds that the proposed Ten Mile River bridge replacement project will protect an existing informal public accessway to the shoreline located at the south end of the bridge. The Commission also finds that it is necessary to condition its concurrence with CC-074-05 to state that the California Department of Transportation will submit revised project plans via coastal development permit applications for the project that provide for pedestrian pathways separated from vehicle traffic lanes and located within the eight-foot-wide shoulders on both sides of the bridge. These pedestrian pathways and the vehicle shoulders on the bridge will improve the safety of pedestrians and bicyclists crossing the river on this segment of State Highway 1. The project will also generate adverse but not significant impacts on public access due to Highway 1 construction delays and the temporary closure of the aforementioned informal accessway during demolition of the existing bridge. However, the replacement of the Ten Mile River bridge with a new bridge that meets current seismic safety standards will ensure the long-term protection of public access and recreation provided by Highway 1 on this section of the Mendocino coast. Therefore, the Commission finds that if modified in accordance with the Commission's conditional concurrence, the proposed project would be consistent with the public access and recreation policies of the CCMP (Coastal Act Sections 30210-14, 30220-21, and 30223).**

D. Marine Resources

The Coastal Act provides the following:

> ***Section 30230. Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.***
>
> ***Section 30233.***

(a) The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:

. . .

(5) Incidental public service purposes, including but not limited to, burying cables and pipes or inspection of piers and maintenance of existing intake and outfall lines . . .

(c) In addition to the other provisions of this section, diking, filling, or dredging in existing estuaries and wetlands shall maintain or enhance the functional capacity of the wetland or estuary. Any alteration of coastal wetlands identified by the Department of Fish and Game, including, but not limited to, the 19 coastal wetlands identified in its report entitled, "Acquisition Priorities for the Coastal Wetlands of California", shall be limited to very minor incidental public facilities, restorative measures, nature study, commercial fishing facilities in Bodega Bay, and development in already developed parts of south San Diego Bay, if otherwise in accordance with this division . . . .

The proposed Ten Mile River bridge replacement project requires construction within the Ten Mile River, in eelgrass beds in the river, and within adjacent wetlands on the south bank of the river. The project will generate permanent and temporary impacts on wetlands and marine resources, including the federally endangered tidewater goby and federally threatened coho salmon, chinook salmon, and northern California steelhead. This section of the report will examine the wetland and marine resources present, describe project impacts on those resources, determine project consistency with the allowable use and alternatives policies of the Coastal Act, and review the marine resources mitigation plans.

1. <u>Wetland Resources</u>. Caltrans' *Wetland Delineation and Assessment* (April 2005) for the proposed project describes the wetland resources in the project area:

Below the north embankment of the GP haul road, the project extends into the adjacent wetlands along the south bank of the Ten Mile River. These wetlands are dominated by habitat transitioning from Freshwater Marsh (52400) to Coastal Brackish Marsh (52200). Within the freshwater marsh, the dominant plant types found are willow (Salix hookeriana), wax myrtle (Myrica californica), scrub with an understory of slough sedge (Carex obnupta) and water hemlock. Closer to the

river the adjacent wetland is dominated by wetland grasses and Pacific silverweed (Potentilla anseriana). The banks of the river are vegetated with a mix of salt rush (Juncus lesueurii), salt grass (Distichalis spicata), Scirpus maritimus, Pacific silverweed, and pickleweed (Salicornia virginica).

. . .

The estuary has extensive aquatic areas vegetated with eelgrass (Zostera marina), interspersed with non-vegetated mud in both shallow and deep-water channels.

. . .

The boundary between wetland and non-wetland areas was determined by following the margin between the dominant wetland vegetation and upland vegetation. Often this differentiation corresponded with a change in elevation or soil type.

Corps jurisdictional wetlands within the study area are delineated in Figure 2. There are 1.12 ha (2.77 ac) of Corps jurisdictional wetlands within the study area.

"Other waters" which are subject to Corps regulation were also delineated within the study area. These consist of the river below the ordinary high water level. This area also includes the eelgrass flats, which are designated by EPA as a "special aquatic site." There are 1.44 ha (3.55 ac) of "other waters" including eelgrass flats with a total length of 110 m (360 ft) within the study area.

For the purpose of the delineation of Coastal Zone jurisdictional wetlands, all of the Corps wetlands and "other waters" constitute Coastal Zone jurisdiction as wetlands . . . There are 2.84 ha (7.02 ac) of Coastal Zone jurisdictional wetlands within the study area . . . .

The Commission staff reviewed the *Wetland Delineation* report and requested that Caltrans provide a more thorough analysis of wetland data points to confirm the determination of wetland boundaries in the project area. The additional information was provided in *Wetland Delineation Supplemental Information* (August 11, 2005) and this report confirmed the initial wetland boundaries (Exhibit 18).

Caltrans also submitted its final *Eelgrass Mitigation and Monitoring Plan* (August 15, 2005) which documents eelgrass distribution in the project area (Exhibit 19):

> ***The Ten Mile estuary has extensive aquatic areas vegetated with eelgrass (Zostera marina), interspersed with non-vegetated mud in both shallow and deep-water channels. All of this area is classified as wetlands for the California coastal zone. In addition, the eelgrass and mud flats are "special aquatic sites", and the deep-water channels are "other waters" for the purpose of Army Corps of Engineers jurisdiction.***

The *Wetland Delineation Supplemental Information* (August 11, 2005) also provided additional information on eelgrass in the project area:

> **The eelgrass was delineated within the estuary, both upstream and downstream of the bridge, by examining the bottom of the river at low tide for the presence of eelgrass. The water in the river was very clear and the bottom at depths of over 6 feet was visible. Observations and photographs were taken from the bridge deck every 5 meters between the riverbanks, both upstream and downstream of the bridge. The results were sketched onto the wetland delineation sheet. The density of eelgrass was highly variable (as observed) but was not measured.**

Since the Commission review of CC-074-05 in November, 2005, Caltrans' Final Eelgrass Mitigation and Monitoring Plan has been revised at least twice. The most recent version (Exhibit 3A) is dated April 7, 2006. The California Department of Fish and Game has notified Commission staff by copy of a letter dated May 6, 2006 that the agency remained concerned that:

> "...The Plan proposes pre- and post-construction eelgrass surveys for the temporary impacts to eelgrass from shading, barge grounding, etc. If there are significant differences in area and density of eelgrass, then CDOT proposes to replant eelgrass to pre-construction amounts. There is no success criteria provided for assessing if the re-planting will be successful. For impacts to eelgrass from the cofferdam excavations, replanting of eelgrass is proposed. Again, there is no success criteria proposed to assess the success of the replanting. The Department recommends that CDOT follow the guidance of the Southern California Eelgrass Mitigation Policy for acceptable success criteria in assessing eelgrass transplant success. In addition, if eelgrass replanting is required post-construction, then a minimum ratio of 1.2:1 should be used to compensate for temporal losses and to insure "no net loss" of eelgrass."

To ensure that the eelgrass monitoring plan provides sufficient monitoring and success criteria to ensure that impacts are fully identified and mitigated, the Commission finds it necessary to impose Special Condition 5 (Revised Eelgrass Mitigation and Monitoring Plan.) Special Condition 5 also requires Caltrans to survey the areas of eelgrass habitat potentially affected by the installation of the temporary trestle piles and the outer casing for noise attenuation, and if impacts are identified in these areas after one year has passed since the trestle piles were removed, to replant the eelgrass in accordance with the requirements of the condition.

Caltrans examined the presence in the project area of the federally endangered tidewater goby in its *Biological Assessment* (September 2004) submitted to the U.S. Fish and Wildlife Service. The tidewater goby is a small fish, rarely exceeding two inches in length, generally restricted to waters with low salinity in California's coastal wetlands. All tidewater goby life stages are located in lagoons and estuaries, and in northern California the tidewater goby likely breeds both in the spring and fall. Based on surveys conducted between 1994 and 2003, tidewater goby populations are presumed to exist in the Ten Mile River estuary; the river in the vicinity of the existing Hwy.1 bridge provides suitable habitat for the tidewater goby.

The Ten Mile River supports populations of coho salmon, chinook salmon, and steelhead. Caltrans' *Biological Assessment* (September 2004) submitted to NOAA Fisheries examines the current state of these populations in the project area:

> ***Both adult and juvenile coho are expected to be in the river system during different phases of the construction although neither life stage would probably be spending extended periods of time in the vicinity of the bridge. Adults would be moving much further upstream to spawning areas and juveniles would likely be rearing upstream of the bridge where oxygen levels are higher, and water temperatures would be cooler with little or no salinity. Although coho would be using the estuary where the bridge is located only as a migratory corridor, the possibility that individuals could be near the bridge can not be entirely ruled out therefore, the project may affect the species.***
>
> ***. . . there is evidence that chinook juveniles may spend time rearing for short periods of time in estuaries prior to swimming out to the ocean. Of the three listed salmonid species, it is more likely that only juveniles of chinook would be spending time rearing near the bridge since their downstream migration period begins in late winter when water temperatures throughout the system would be cooler. Both adult and juvenile chinook may be traveling upstream and downstream respectively during the pile driving in late fall and winter and therefore may be affected by the project.***
>
> ***As with other salmonid species, steelhead presumably use the river in the vicinity of the project primarily as a migratory corridor. Steelhead should be absent from the bridge area during construction of the trestle, falsework, and cofferdams. However, both upstream and downstream peak migrations of adult steelhead would be occurring beginning November when pile driving is slated to occur.***

2. <u>Project Impacts</u>. Caltrans' April 2005 *Wetland Delineation and Assessment* contained information on expected impacts to wetlands from

construction and demolition activities. However, the Commission staff requested more precise analysis of potential temporary impacts to wetland resources, including a breakdown of the type of impacts, duration of impacts, and the likely wetland effects. To address those effects, Caltrans submitted its aforementioned *Wetland Delineation Supplemental Information* report in August 2005.

The proposed bridge has a total of seven piers, with each pier comprised of two concrete columns (each column covers an area of 28.3 sq.ft. and each pier therefore covers an area of 56.6 sq.ft.). Two piers will be located in an upland area and three piers will be placed in the river. Two of the piers will be constructed in the wetlands on the south bank of the river and will permanently impact 113 sq.ft. of wetland habitat. It should be noted that the seven piers for the replacement bridge will occupy a total footprint of 396 sq.ft., and that five of these piers (occupying 283 sq.ft.) would be within the river and wetland habitat. The piers and columns in the river and wetland habitat associated with the existing bridge to be removed occupy a total footprint of 450 sq.ft. Therefore, the bridge replacement project will ultimately provide for a *net decrease* in the amount of river and wetland fill. Temporary impacts to wetlands will arise from placement of pilings to support trestles and falsework for new bridge construction and old bridge demolition, cofferdam excavation to support new pier construction and old pier removal, fill for construction of an access road to the old bridge demolition site, ground mats to catch demolition debris, and shading from trestles and falsework. The following table summarizes the expected temporary effects to wetlands:

Temporary Wetland Impacts		
	sq.ft.	duration
Shading (trestle/falsework)		
new bridge	58,265	21 mos.
old bridge	20,165	6 mos.
Pilings		
new bridge	404	21 mos.
old bridge	119	6 mos.
Cofferdams		
new bridge	7,639	14 mos.
old bridge	5,886	2 mos.
Road Fill		
old bridge	10,071	6 mos.
Ground Mat		
old bridge	13,450	3 mos.

As noted previously, three of the piers for the new bridge will be constructed in the channel of Ten Mile River; these structures will result in the permanent loss of 170 sq.ft. of eelgrass beds in the river. Temporary impacts to eelgrass beds in the river are summarized in the following table:

Temporary Eelgrass Impacts		
	sq.ft.	duration
Shading (trestle/falsework)		
new bridge	20, 982	19 mos.
old bridge	10,825	6 mos.
Pilings		
new bridge	144	19 mos.
old bridge	84	6 mos.
Cofferdams		
new bridge	1,829	14 mos.
old bridge	753	2 mos.

The bridge replacement project may adversely affect the federally endangered tidewater goby. Caltrans' September 2004 *Biological Assessment* delivered to the U.S. Fish and Wildlife Service summarized the potential impacts:

> ***Impacts to the substrate will be temporary and localized. There is the chance that vibrations from pile driving could collapse burrows resulting in mortality of individuals and missed reproductive efforts. Pile driving may also alter the goby's behavior or in extreme cases, result in mortality. Fish rescues, if required during installation of the attenuation and containment systems for the new and old bridges respectively, may also result in mortality of stranded juvenile fish. Therefore, the project may affect and is likely to adversely affect the tidewater goby.***

The bridge replacement project may also adversely affect federally threatened populations of coho salmon, chinook salmon, and steelhead in the Ten Mile River. Caltrans' September 2004 *Biological Assessment* delivered to NOAA Fisheries summarized the potential impacts:

> ***First year chinook juveniles and second year coho salmon and steelhead may be out-migrating during the time the trestles, falsework, and attenuation systems for the new and existing bridges are constructed. Also, there is a low probability that first year juvenile***

coho and steelhead could be rearing in the project area during this portion of the in-river work. Although unlikely, these project components may alter fish behavior and in extreme cases, although even more unlikely, result in mortality.

Fish rescue during construction of the attenuation and containment systems for the construction of the new bridge and demolition of the existing bridge respectively, may adversely affect juvenile fish and may result in mortality of some individuals.

Although doubtful, noise effects from driving permanent piles may affect and could likely adversely affect adults of all three salmonid species. Although changes in behavior may occur due to noise, the chance of mortality is low.

The proposed project is not likely to result in adverse modification of designated critical habitat for coho salmon.

3. Allowable Use. As described above, the proposed project includes permanent fill in estuarine waters and wetlands as defined under the Coastal Act, and therefore triggers the three-part test under Section 30233(a): allowable use, alternatives, and mitigation. The Ten Mile River estuary is one of the 19 listed coastal wetlands referred to in Section 30233(c), and the proposed project must be consistent with the allowable use provision of this section as well. In addition, the Mendocino County LCP provides in Section 3.1-6 that in the wetland portions of Ten Mile River development shall be limited to wetland restoration, nature study, and salmon restoration projects.[3]

Under the first of the Section 30233(a) tests, a project must qualify as one of the eight stated uses allowed under Section 30233(a). Since the other allowable uses clearly do not apply, the Commission must determine whether the proposed project can be permitted under Section 30233(a)(5), which authorizes fill for:

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[3] It is reasonable to conclude that this policy applies to proposed projects that generate adverse impacts on wetlands beyond the existing baseline level of impact in the Ten Mile River. The proposed bridge replacement project will result in a net *reduction* in the amount of wetland fill in the river. Alternatively, to the extent that an argument can be made that the proposed fill is not consistent with this policy, such an argument would not be binding on the Commission in that the standard of review for the proposed project in this consistency review is the Chapter 3 policies of the Coastal Act and not the Mendocino County LCP.

> ***Incidental public service purposes, including but not limited to, burying cables, pipes or inspection of piers and maintenance of existing intake and outfall lines.***

In order for an "incidental public service purpose" a proposed fill must satisfy two tests: (1) the project must have a "public service purpose"; and (2) the purpose must be "incidental" within the meaning of that term as it is used in Section 30233(a)(5). Because the project will be constructed by a public agency (Caltrans) for the purpose of replacing the seismically unsafe Hwy.1 bridge crossing the Ten Mile River, the fill is for a public service purpose. Thus, the project satisfies the first test under Section 30233(a)(5).

With respect to the second test, in 1981 the Commission adopted the "Statewide Interpretive Guidelines for Wetlands and Other Wet Environmentally Sensitive Habitat Areas" (hereinafter, the "*Guidelines*"). The *Guidelines* analyze the allowable uses in wetlands under Section 30233 including the provision regarding "incidental public service purposes." The *Guidelines* state that fill is allowed for:

> ***Incidental public service purposes which temporarily impact the resources of the area, which include, but are not limited to, burying cables and pipes, inspection of piers, and maintenance of existing intake and outfall lines (roads do not qualify).***

A footnote (no. 3) to the above-quoted passage further states that:

> ***When no other alternative exists, and when consistent with the other provisions of this section, limited expansion of roadbeds and bridges necessary to maintain existing traffic capacity may be permitted.***

The Court of Appeal has recognized the Commission's interpretation in the *Guidelines* of the term "incidental public service purposes" as a permissible one. In the case of *Bolsa Chica Land Trust et al., v. The Superior Court of San Diego County* (1999) 71 Cal.App.4th 493, 517, the Court found that:

> ***. . . we accept Commission's interpretation of sections 30233 and 30240 . . . In particular we note that under Commission's interpretation, incidental public services are limited to temporary disruptions and do not usually include permanent roadway expansions. Roadway expansions are permitted only when no other alternative exists and the expansion is necessary to maintain existing traffic capacity.***

In past cases the Commission has considered the circumstances under which fill associated with the expansion of an existing "roadbed or bridge" might be allowed under Section 30233(a)(5). In such cases the

Commission has determined that, consistent with the analysis in the *Guidelines*, the expansion of an existing road or bridge may constitute an "incidental public service purpose" when no other alternative exists and the expansion is necessary to maintain existing traffic capacity.

The Commission previously granted to the Cities of Seal Beach and Long Beach a coastal development permit (5-00-321) for the construction of bridge abutments and concrete piles for the Marina Drive Bridge located on the San Gabriel River. The Commission found that the project involved the fill of open coastal waters for an incidental public service purpose because the fill was being undertaken by a public agency in pursuit of its public mission, and because it maintained existing road capacity.

The Commission also determined in conjunction with a project (El Rancho Road Bridge) proposed by the U.S. Air Force at Vandenberg AFB that permanent impacts to wetlands are allowable under Section 30233(a)(5) of the Coastal Act as an incidental public service because the Air Force was undertaking the fill in pursuit of a public service mission and because the "permanent fill [was] associated with a bridge replacement project [that] would not result in an increase in traffic capacity of the road." (CD-070-92, and reiterated in CD-106-01).

The Commission recently concurred with a consistency determination submitted by the Bureau of Land Management (CD-084-04) for a roadway repair project on the South Spit of Humboldt Bay that required fill of open coastal waters to prevent the erosion and undermining of South Jetty Road by tidal and wave action. The repair project did not increase road capacity and was necessary in part to protect public access to and along the bay and ocean shoreline.

Thus, based on past interpretations, fill for the expansion of existing roadways and bridges may be considered to be an "incidental public service purpose" if: (1) there is no less damaging feasible alternative; (2) the fill is undertaken by a public agency in pursuit of its public mission; and (3) the expansion is necessary to maintain existing traffic capacity. The Ten Mile River bridge replacement project will not increase the existing capacity of Highway 1 in this region of Mendocino County. Rather, the project is necessary in order to ensure that this segment of Highway 1 is not severed by an earthquake and to prevent the significant disruption to residents, tourists, and the regional economy that a bridge collapse would generate.

Furthermore, while Ten Mile River estuary is one of the "priority wetlands" afforded additional protection under Section 30233(c), which was not at issue in the above-referenced cases, the Commission finds that: (1) the project will not alter or affect the functional capacity of the Ten Mile River estuary; and (2) even if it considered the project to alter the estuary, the

project can be considered a "very minor incidental public facility" based on the same rationale discussed above and in the Commission's wetlands guidelines[4] and several past Commission permit reviews.[5] These reviews and guidelines apply the same test for a project that the Commission has determined is necessary to maintain existing capacity to constitute an allowable use under Section 30233, regardless of whether it is being viewed as an "incidental public service" under Section 30233(a), or a "very minor incidental public facility" under Section 30233(c). Thus, the Commission has determined that a limited expansion of an existing transportation facility that is necessary to maintain existing capacity is an allowable use as an incidental public service under either Section 30233(a)(5) or Section 30233(c). Moreover, because it will result in a net decrease of fill in the estuary, the project will not adversely affect the functional capacity of the Ten Mile River estuary, a secondary test of Section 30233(c). Therefore, the Commission finds that the Ten Mile River bridge replacement project is an allowable use as an incidental public service and a very minor incidental public facility under Sections 30233(a) and 30233(c) of the Coastal Act, respectively.

4. <u>Alternatives</u>. Caltrans examined a number of alternatives to the proposed project and these alternatives are examined in the April 2005 *Project Report*:

> ***The project began as a seismic retrofit of the existing bridge to meet current seismic standards. During the course of project development, a hydraulic study concluded that the consultant's pier footing design would cause the bridge to become "scour critical" and, therefore, vulnerable to collapse during a large flood event. A decision was made by Caltrans management to replace the existing bridge with a new bridge which would address both scour and seismic concerns.***

The specific details of the proposed project alternative were described previously in Section I of this report. The replacement and retrofit alternatives considered by Caltrans in the *Project Report* are as follows:

- **<u>No-Build</u>. This alternative would not correct the seismic deficiencies of the existing bridge, would risk public safety, and would not meet**

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[4] The Commission's wetland guidelines include a footnote for "incidental public services," which states: [Footnote 3:] "When no other alternative exist, and when consistent with the other provisions of this section, limited expansion of roadbeds and bridges necessary to maintain existing traffic capacity may be permitted." The footnote for "very minor incidental public facilities" states: "(see footnote #3)."

[5] Including Coastal Development Permit 6-97-11, City of Carlsbad, Cannon Rd./Kelly Ranch.

the goals of the seismic safety program mandated by the State Legislature.

- **Alternative A. Construct a bridge 60 to 150 feet upstream of the existing bridge. This alternative generated a longer bridge and greater wetland impacts.**

- **Alternative B. Construct a bridge 33 to 108 feet west of the existing bridge. This alternative generated a shorter bridge and fewer impacts to wetlands, but greater impacts to listed plants and to MacKerricher State Park.**

- **Alternative 1. Retrofit the bridge with outrigger bents and encasing the existing columns. This alternative generated greater impacts to the river channel, eelgrass, and visual resources, and would only extend the life of the bridge for 20 years.**

- **Alternative 2. Retrofit the existing bridge with enlarged foundations, additional pilings, and encasing the existing columns. This alternative generated greater impacts to the river channel, wetlands, and listed salmonids, would be difficult to mitigate impacts, and would only extend the life of the bridge for 20 years.**

- **Other Rejected Alternatives. (a) construct new bridge on existing alignment; rejected due to the need to construct a temporary bridge prior to demolition and construction of new bridge, and the resultant greater environmental impacts; (b) install seismic-activated traffic gates at both ends of the existing bridge to prevent vehicles from entering bridge at the start of an earthquake; rejected because it did not meet the project purpose or state seismic safety mandate.**

As noted previously in this report, the existing Ten Mile River bridge does not meet current state seismic safety standards, would likely suffer significant damage from or would collapse during a major earthquake, and must be replaced by Caltrans. While the proposed bridge replacement project will create adverse effects on marine resources: (1) alternatives to the proposed project would generate greater adverse effects on the river channel, eelgrass beds, wetlands, federally endangered and threatened fish species, listed plant species, visual resources, and/or public access and recreation; (2) the proposed project includes a construction alternative designed to minimize adverse marine resource impacts, the use of temporary trestles to support new bridge construction and existing bridge demolition; and (3) as will be discussed in the following section, adverse impacts will be mitigated. While these structures require the driving of approximately 650 temporary pilings to support the trestles, this amounts to only 63 sq.ft. of direct habitat loss in the river, wetlands, and upland

areas. The alternative to using pile-supported trestles was to construct temporary, but nevertheless substantial earthen fills across wetlands and across the river channel to support construction and demolition falsework. These land and river fills would clearly generate tremendously significant impacts to wetlands and the biological resources of Ten Mile River and were rejected in favor of the pile-supported trestles. The Commission agrees with Caltrans' determination that the proposed replacement bridge is the least environmentally damaging feasible alternative and that the project meets the alternatives test of Section 30233(a)(5) of the Coastal Act.

5. Mitigation. Caltrans is proposing a wide range of avoidance, minimization, and mitigation measures to ensure that the proposed project meets the Section 30233(a) requirement that "feasible mitigation measures have been provided to minimize adverse environmental effects." This section of the report will address mitigation measures provided for impacts to wetlands, eelgrass, and salmonids and tidewater gobies. Caltrans submitted to the Commission staff a wetland delineation report, eelgrass mitigation and monitoring plan, revegetation plan, documents and memos regarding pile-driving noise effects on fish, and biological assessments that described Caltrans' wetlands and marine resources restoration and mitigation plans.

(a) Wetlands. The August 2005 *Wetland Delineation Supplemental Information* document describes Caltrans' proposed wetland restoration measures. This report states in part that:

> ***Restoration of these* [shading effects] *areas range from just the removal of the temporary impact and allow unassisted regeneration of the vegetation, to replanting areas that are unlikely to revegetate without intervention.***
>
> ***Total disturbance of the habitat is likely to occur from the placement of temporary pilings and temporary fills for access roads. The areas impacted by the placement of pilings are relatively small and dispersed, and would be expected to revegetate naturally after the pilings are removed. After the fill placed for the temporary road is removed for off-site disposal, that area will be replanted to facilitate re-establishment of native vegetation.***
>
> ***Total disturbance of the various habitats will result from the installation, excavation, and removal of cofferdams used to construct new bridge footings and to remove the old bridge footings. These excavations will be restored by filling the cofferdam area with native soil to match the adjacent topography followed by replanting with appropriate native vegetation.***

A moderate level of disturbance is likely to occur from the temporary debris cover used to catch and retain debris for off-site disposal during the demolition of the old bridge. The placement of the debris cover will shade the ground and crush all vegetation. However, the debris cover will be used under the old bridge where the bridge shadow already limits natural vegetation. The duration of the debris cover is very short and occurs in the late fall when most plants are dormant. After the bridge rubble and debris cover are removed, the area impacted is expected to recover naturally within the first season by natural regeneration. Other than the placement of permanent erosion control in areas of exposed soil, no further treatment of these areas is likely to be needed.

The September 2005 *Revegetation Plan* provides additional information on wetland restoration plans, including planting plans, monitoring requirements, success criteria, remedial actions, contingency measures, and maintenance of restored areas (Exhibit 20).

The Commission staff reviewed the proposed wetland restoration and revegetation plans and requested that additional measures be included to ensure successful restoration. Caltrans agreed to add the following measures to the proposed project:

- **The replacement bridge at Ten Mile River will lead to the permanent loss of 113 sq.ft. of wetland habitat due to the placement of two bridge piers on the south bank of the river. Given the Commission's numerous prior actions requiring that mitigation for permanent wetland fill is to be restoration of wetland habitat at a 3:1 mitigation ratio, 339 sq.ft. of on-site wetland restoration is required for this project. As a part of the demolition of the existing bridge, the existing bridge columns that currently occupy 200 sq.ft. of wetland habitat on the south bank of the river will be removed. Caltrans will plant and restore these bridge column footprints with wetland vegetation. Therefore, Caltrans' net mitigation requirement for permanent wetland impacts is 139 sq.ft. of additional on-site wetland restoration. Caltrans will implement this planting and restoration work at a site on the south bank of the river adjacent to the existing bridge.**

- **For temporary impacts to wetland habitat, Caltrans will: (1) implement the various restoration actions (e.g., stockpile all excavated materials, soil backfill, benthic sediment backfill, plantings, monitoring) identified in the aforementioned restoration plans upon completion of project construction; (2) survey the temporary impact areas one year after completion of project construction ; (3) based on the survey results, implement further**

restoration actions (e.g., soil/sediment backfill, plantings) for those temporary impact areas that did not return to pre-project conditions; and (4) continue this survey/restoration work until all temporary impact areas are returned to pre-project conditions.

(b) Eelgrass. The August 15, 2005, Eelgrass Mitigation and Monitoring Plan provides details on project impacts to eelgrass, goals and objectives of the mitigation plan, pre- and post-construction survey details, mitigation techniques, and the monitoring and reporting program. The document states that the project includes 170 sq.ft. of new fill (from new bridge piers) of eelgrass beds in the river and the removal of 250 sq.ft. of existing fill (from existing bridge piers) of eelgrass beds. Caltrans concluded that since the project will result in a net gain of eelgrass habitat, no additional mitigation is required. After reviewing the *Plan*, the Commission staff reported to Caltrans that the "net gain" conclusion rests on the assumption that eelgrass will naturally recover in those areas where existing bridge piers are removed. If it does not, the project could generate a net loss of eelgrass habitat. Therefore, Caltrans agreed to add the following measure to the proposed project:

- **If the 250 sq.ft. area of existing bridge piers and columns has not naturally recovered with eelgrass one year after the completion of project construction, Caltrans will plant those areas with eelgrass. All materials excavated within cofferdams in the river (for construction of new piers and removal of existing piers) will be stockpiled for replacement to ensure an adequate substrate for eelgrass revegetation.**

In addition, Caltrans agreed to modify its mitigation plan for temporary impacts to eelgrass in a manner similar to temporary wetland impacts:

- **For temporary impacts to eelgrass, Caltrans will: (1) implement the various restoration actions (e.g., stockpile all excavated materials, soil backfill, benthic sediment backfill, plantings, monitoring) identified in the aforementioned eelgrass plan upon completion of project construction; (2) survey the temporary impact areas one year after completion of project construction ; (3) based on the survey results, implement further restoration actions (e.g., soil/sediment backfill, plantings) for those temporary impact areas that did not return to pre-project conditions; and (4) continue this survey/restoration work until all temporary impact areas are returned to pre-project conditions.**

Caltrans submitted a project-wide *Revegetation Plan* on July 8, 2005. The Commission staff reviewed and submitted comments on this plan and requested that Caltrans submit a revised plan. The staff received the

revised *Revegetation Plan* on September 20, 2005. The *Plan* includes a description of the project area, restoration goals, implementation schedule, information on site preparation, a planting plan and plant palette, information on success criteria, monitoring plans, maintenance and remedial actions, and reporting requirements. Revegetation of all disturbed areas will use native plant stock from the project work site and/or materials grown from propagules originating within a range from the Russian River northwards to Humboldt Bay and within an inland extent of ten miles from the coast.

The *Plan* states that two sets of criteria were established to evaluate the success of revegetation efforts:

1. **An intermediate set of criteria that will be used to determine whether the replanted habitat is developing on a course that will meet the revegetation plan goals, and**
2. **Final criteria that will determine whether the revegetation plan goals have been actually achieved. Failure to meet this criteria will require re-evaluation of the site conditions followed by corrective measures. The final success criteria will not be considered to have been met until a minimum three-year period with no remedial actions is achieved (excluding invasive plant abatement activities).**

Planted areas will be monitored twice annually at the beginning (approx. January) and end (approx. August) of the growing season for a period of five years, and annual reports will be provided to the Coastal Commission by December 31.

(c) <u>Salmonids and Tidewater Gobies</u>. Caltrans has consulted and negotiated with the U.S. Fish and Wildlife Service, NOAA Fisheries, and California Department of Fish and Game (CDFG) to develop mitigation measures to reduce the potential for significant adverse project impacts on listed fish species. The agreed-upon measures include in-water construction work windows, construction materials and techniques, monitoring, and fish habitat enhancement. The details are provided in the consistency certification, *Project Report*, *Biological Assessments*, *Ten Mile River Bridge Replacement Project – Hydroacoustic Report*, and letters from Caltrans to the CDFG (dated August 24, 2005, and September 19, 2005). The September 19, 2005, letter states that the proposed work windows were designed to minimize effects to both the tidewater goby and the listed salmonid species (coho and Chinook salmon and steelhead). The goby's breeding periods as well as the use of the project location area by salmonids primarily as a corridor during migrating stages were considered while formulating the following construction windows:

- **Temporary Piles: Pile driving for temporary trestles, falsework, and cofferdams would be permitted for the new bridge's first year of**

construction between June 15 and October 31. Additional work windows for pile driving for temporary trestles, falsework, and cofferdams in subsequent years would occur between September 15 and October 31, for both new bridge construction and existing bridge demolition.

- **Permanent Piles: Installation of permanent piles would occur year round within dewatered cofferdams. The cofferdams for the permanent piles would be installed between June 15 and October 31 the first season, and between September 15 and October 31 the following two seasons.**

Caltrans references the September 2005 *Hydroacoustic Report* and states that the best noise attenuation method for permanent pile driving (i.e., to reduce peak sound pressure levels to 190 decibels (dB)) is to pile drive within dewatered cofferdams. To that end, Caltrans states that it is:

> ***. . . committed to dewatered cofferdams during permanent pile driving as a noise attenuation measure. For this project, water would be lowered within each cofferdam (eight total required – three for the proposed new bridge, and five for the existing bridge pier) by pumping to allow trapped fish to be rescued. After the fish rescue is completed, the water level inside the cofferdam would be kept at or below the existing river mudline. Maintaining the water at this level achieves the highest level of noise attenuation for permanent pile driving.***

While originally not a part of the project, after discussion with the aforementioned resource agencies, Caltrans reports that it now proposes to drive the temporary pilings within Double- Walled Isolation Casings:

> **Dewatered Isolation Casing creates an "air" space between the temporary H pile and the surrounding river. This system was utilized on the Humboldt Bay Bridges Seismic retrofit project and was found to provide about 9 dB of attenuation. The driving of temporary H piles through a Dewatered Isolation Casing should not cause peak pressure levels over 190 db at 10 meters, and is described in the attached Hydroacoustic Report.**

Caltrans further states in its September 19, 2005, letter that the type and size of temporary and permanent piles has changed:

> **The attached Hydroacoustic Report indicates temporary steel piles create higher dB levels than temporary H piles. In order to attenuate noise, during project development Caltrans changed the project to include H piles instead of steel piles. Early analysis also indicated that larger diameter cast in steel shell (CISS) permanent piles create higher dB levels than smaller diameter piles. To reduce potential**

> **peak noise levels, Caltrans changed foundation type and reduced the diameter of the cast in steel shell (CISS) piles from eight foot to 30 inch.**

The *Hydroacoustic Report* also includes a description of the methodology to be used for monitoring noise levels during pile driving operations in the Ten Mile River. Caltrans has committed to contacting CDFG and NOAA Fisheries if noise levels exceed (at ten meters from the source) 190 dB sound pressure level during monitoring (excluding errant measurements). Caltrans has also committed to submitting a copy of the noise monitoring plan to be implemented at the Ten Mile River project site to the Commission's Executive Director for review and approval prior to the start of in-water construction activities.

U.S. Fish and Wildlife Service staff reported to the Commission in September 2005 that while the proposed project in-water pile driving construction windows, sound attenuation devices, and the 190 dB level would likely lead to adverse effects on tidewater gobies during one breeding season, other mitigation alternatives would lead to a longer cumulative construction period and greater adverse impacts on the goby. The USFWS determined that the proposed project schedule and mitigation measures represent the best and least damaging feasible way to protect the goby and construct the replacement bridge.

The consistency certification states that a fisheries biologist would be onsite during the installation of the cofferdams and the pumping process to capture and move trapped gobies and salmonids, along with any other fish, to suitable habitat upstream of the work area. The project does not include any night work and, as a result, the use of lights will not be required during construction.

In addition to the above measures, Caltrans has committed to implement a fish enhancement project to further mitigate impacts to coho salmon that may occur during project construction. Caltrans initially identified the culvert at Digger Creek/Hwy. 1 (near Fort Bragg) as a suitable location for a coho salmon passage enhancement project. However, in its September 19, 2005, letter to CDFG, Caltrans found that:

> ***. . . although coho may have historically been in Digger Creek the rainbow trout farm downstream of Caltrans' Digger Creek culvert most likely extirpated the coho from the system. Based on this information, we will be selecting a different location in order to fulfill our mitigation requirements.***

As of this date, no final decision has been reached by Caltrans and the resource agencies for the location of the fish habitat enhancement project. However, Caltrans has committed to submit to the Executive Director, prior

to the start of project construction, additional details (e.g., location, scope of work, objectives, cooperating partners) on the proposed fish enhancement project.

(d) Conclusion. Construction and demolition activities for the Ten Mile River bridge replacement project will occur in and adjacent to freshwater and brackish water wetlands found along the south bank of the river. Other activities will take place directly in the river, which is home to the endangered tidewater goby, serves as a migration corridor for threatened coho and chinook salmon and northern California steelhead, and supports healthy and extensive beds of eelgrass. The project will ultimately result in a net decrease in the amount of permanent fill in wetlands and eelgrass beds, due to a reduction from 450 sq.ft. to 283 sq.ft. in the footprint of piers and columns which support the existing and replacement bridges, respectively. However, the project does include new fill of coastal waters. The proposed fill is an allowable use under the "incidental public service" provision of Section 30233(a)(5) as the project is a limited expansion of an existing transportation facility necessary to maintain existing capacity. The project will not alter or affect the functional capacity of the Ten Mile River estuary and can be considered a "very minor incidental public facility" based on previous Commission reviews of development in Section 30233(c) "priority wetlands."

The proposed project is the least environmentally damaging feasible alternative, in terms of its river crossing location, design features to minimize intrusions into wetland habitat, and construction methods and scheduling. Mitigation (at a ratio of 3:1) for the permanent wetland impacts includes creation of 139 sq.ft. of additional on-site wetland restoration. The project will also generate temporary impacts (ranging between three to twenty-one months) on wetlands and eelgrass due to pilings, excavation, fill, ground mats, and shading. Mitigation includes removal of all construction and demolition materials, implementation of revegetation and eelgrass mitigation plans, and restoration of all disturbed areas to pre-project conditions. The project revegetation plan includes planting plans, monitoring requirements, success criteria, remedial measures, and maintenance of restored areas. Final success criteria for wetland and eelgrass restoration will not be met until a minimum three-year period with no remedial actions is achieved.

Temporary project impacts on listed species of fish present in the Ten Mile River in and adjacent to the project area arise primarily from noise generated by pile driving for the new bridge piers, and for the trestles and framework needed to construct the new bridge and demolish the existing bridge. To minimize adverse effects on these species, the project includes seasonal restrictions and work windows for in-water pile-driving, requirements that permanent pilings be driven within dewatered cofferdams and temporary pilings be driven within double-walled isolation

casings, the use of H piles rather than steel piles for the temporary pilings, monitoring of noise levels during pile driving, capture and relocation of trapped fish from the cofferdams to suitable habitat upstream from the work area, and implementation of an off-site coho salmon passage enhancement project.

As a result, the Commission concludes that the proposed project is an allowable use and is the least environmentally damaging feasible alternative for replacing the Ten Mile River bridge. The Commission also concludes that the project is designed to minimize permanent and temporary impacts within wetland and eelgrass habitat, and includes adequate measures to mitigate unavoidable permanent and temporary adverse impacts to those habitats. The Commission concludes that the proposed project is consistent with the wetlands and marine resources protection policies of the CCMP (Coastal Act Sections 30230 and 30233).

As set forth above, the Commission's previously adopted analysis of the issue of pile driving and noise remains applicable. At the time of the previous review (November 2005), Caltrans referenced, and the Commission relied on, Caltrans' September 2005 *Hydroacoustic Report* and its September 19, 2005, letter which stated that the best noise attenuation method for permanent pile driving (i.e., to reduce peak sound pressure levels to 190 decibels (dB)) is to pile drive within dewatered cofferdams, and that to achieve this maximum limit, Caltrans would dewater the permanent piles, use Double-Walled Isolation Casings for the temporary piles, reduced the pile diameters, from 8 ft. to 30 inch piles, and use "H piles" rather than steel piles for the temporary piles.

Since the Commission's previous review, Caltrans has: (1) developed a marine mammal monitoring and avoidance plan and (2) re-entered negotiations with the resource agencies on the fisheries monitoring and mitigation measures.

The Marine Mammal Monitoring Plan, as prepared by Caltrans, will (1) include a 500 ft. safety zone designed to avoid exposing marine mammals to 160 dB or greater noise levels; (2) assure that pile driving will not commence at the beginning of a day unless the safety zone is clear (however, the plan provides that if a marine mammal later swims into the safety zone, pile driving will not be curtailed); (3) pile driving will not commence at peak energy/noise levels but rather will begin with a "soft start" ("dry start") involving tapping the pile several times; (4) noise levels will be monitored, and the 500 ft. will be modified up or down if actual noise levels are different than predicted; (5) monthly monitoring summaries will be submitted to NOAA Fisheries; and (6) a final report summarizing the monitoring and any general trends observed will be submitted within 30 days of the completion of the monitoring.

With regard to the Marine Mammal Monitoring Plan, the Commission finds that if conditioned pursuant to Special Condition 4 to clarify that the Commission staff will receive all monitoring reports and that pile driving will not commence in "low visibility" conditions (e.g., heavy fog or where visibility distance is less than the preclusion radius), the project as conditioned would be adequate to protect marine mammals.

Hydroacoustic Task Force. As part of a more programmatic effort to bring together top scientists in the field, review existing research on "barotrauma" and other pressure-related effects, develop noise thresholds for injury to fish, and conduct additional research to increase understanding of impacts, Caltrans is working in conjunction with Washington and Oregon State Transportation agencies, the Federal Highway Administration, the U.S. Army Corps of Engineers, NOAA Fisheries, the U.S. Fish and Wildlife Service, and CDFG. This effort has included establishment of a "Fisheries Hydroacoustic Working Group." The working group appears to generally accepts the premise that:

> *Aquatic pile-driving generates hydroacoustic pressure impulses and particle velocities that can cause effects on fish ranging from altered behavior, hearing loss, and tissue injuries to immediate mortality... [and that] Fish kills from pile driving have been noted on both coasts and have resulted in unforeseen impacts to sensitive fishery resources, as well as project delays and additional costs.*

The group notes that while documented fish kills have occurred due to pile driving, including during work at several San Francisco Bay area bridges in recent years (outside the Coastal Commission's jurisdiction):

> *Because of the lack of available scientific data, agencies are forced to rely on conservative interpretations of existing information including anecdotal data to protect sensitive fish. Most of the work relating to noise impacts on fish has been done with explosives, but because explosives produce pressure waves with unique shapes, intensities, and frequencies, their impacts are not directly comparable to pile driving. There is a need to develop a sound scientific basis to predict impacts and mitigate the negative effects of pile and casing installation and removal projects on fish.*

The group has defined the following tasks to assist this effort:

> *TASKS*
>
> *PHASE I (1.) Conduct a critical analysis of published literature and research in progress on the basis of applicability, conclusiveness of findings, and usefulness for the analytical needs of this study. (2.) Conduct a survey and analysis of current practice among domestic and international transportation, natural resource, and construction entities in government, the private sector, and academia on their experiences with negative impacts on fish resulting from pile and casing installation and removal and document the results of any monitoring or mitigation strategies that have been employed. (3.) Based on the results of Tasks 1 and 2, identify information gaps where further research is needed to achieve the project objectives. (4.) Prepare a draft outline of the proposed guidance document, subject to revision based on the results of Phase II research. It is anticipated that the final product will include guidance that will allow an*

agency to make decisions about specific projects by addressing topics including, but not limited to, the following:

- *Prediction or modeling of noise propagation from pile and casing installation and removal (distinguished from ambient noise levels).*
- *Characterization of fish species present at a site based on susceptibility to impacts (compared with test subjects studied in the research).*
- *Identification of site-specific factors such as water characteristics (e.g., salinity, temperature, and depth), habitat usage (e.g., spawning, foraging, rearing, and migration), geology, and channel morphology.*
- *Assessment of the nature and extent of potential impacts on fish, such as barotrauma, hearing, behavior, and physiology.*
- *Determination of appropriate metrics for description and evaluation of sound pressure and particle velocity levels, and correlation of the levels of those metrics to impacts on fish.*
- *Development of recommended performance measures for mitigation of negative impacts.*
- *Selection or development of appropriate design and construction techniques or mitigation strategies as well as cost-effective and practical measures of evaluating the effectiveness of these techniques and strategies.*
- *Development of implementation guidelines for the design and construction techniques and mitigation strategies selected.*

Task Force Work Products. Among the important work products from the task force's efforts include two papers by noted experts in the field: (1) an overview discussion entitled "Effects of Sound on Fish," (Hastings & Popper, Caltrans, January 28, 2005); and (2) a draft guidance paper entitled "*Interim Criteria* for Injury of Fish Exposed to Pile Driving Operations: A White Paper" (Popper, Carlson, Hawkins, Southall, and Gentry, (Drafts of February 28, 2006, and May 13, 2006). (Exhibits 8A-10A)

Effects of Sound on Fish. The first of these papers, "Effects of Sound on Fish," states:

Introduction

Over the past decade it has become increasingly apparent that human-generated (often called "anthropogenic") sound has the potential to impact the health and well-being of animals as well as humans. There has been, in this same time frame, an increasing awareness of the presence of human-generated sounds in the aquatic environment, and concern has arisen that these sounds could impact aquatic mammals, diving birds, fishes, amphibians, reptiles, and perhaps even invertebrates (e.g., NRC 1994, 2000, 2003; Richardson et al. 1995; Popper 2003; Popper et al. 2004).

Despite the concerns raised by increased human-generated sound in the aquatic environment, very little is known about the effects of exposure to such sounds on marine mammals, and far less is known about the effects on fishes (see reviews in NRC 1994, 2000, 2003; Popper 2003; Popper et al. 2004). And, even

in cases where data are available for fishes, they are so few that one must be extremely cautious in attempting to extrapolate between species, even for identical stimuli. Moreover, one must also be extremely cautious with any attempts to extrapolate results between stimuli because the characteristics of the sources (e.g., air guns, sonars, ship noise, pile driving) differ significantly from one another.

Areas of Uncertainty and Studies Needed

To date, there are few data for fish on the effects of exposure to sound from pile driving, and these only appear in the gray literature (e.g., Anderson 1990; Feist 1992; Bonar 1995; Shin 1995; Caltrans 2001, 2004; Abbott and Bing-Sawyer 2002; Nedwell et al. 2003; Abbott 2004). Although these studies provide some information about exposures to pile-driving sounds, there is little that can be definitively concluded from them. By way of example, there are data and general observations of mortality and some injury to fishes that are close to the source where the level of sound is very high. Additionally, there are observations based on the numbers of fish that come to the surface dead after pile driving that suggest that there is less (or no) mortality at greater distances from the source (where the received level of sound would be lower than close to the pile). Finally, experimental cage studies also suggest that fishes further from the pile have little or no mortality and/or damage (e.g., Caltrans 2001, 2004; Abbott and Bing-Sawyer 2002; Nedwell et al. 2003; Abbott 2004; Marty 2004).

*It does appear, however, that the degree of damage is not related directly to the distance of the fish from the pile, but to the received level and duration of the sound exposure. Because monitoring data show that sound pressure levels do not necessarily decrease monotonically with increasing distance from the pile, it is imperative that received sound levels be measured in future studies in order to develop exposure metrics that correlate with mortality and different types of damage observed in fish exposed to pile driving. The only study we are aware of to date (Caltrans 2004) that was intended to measure the differential in survival between fish exposed to pile driving with a bubble curtain attenuation device turned on and those exposed with the bubbles turned off, was not able to show a statistical difference in survival between the two conditions because the sample sizes were too small. Though in a study using an explosive sound source, Keevin et al. (1997) showed that use of a bubble curtain significantly reduced mortality of caged bluegill (*Lepomis macrochirus*) during demolition of a dam and locks on the Mississippi River.*

It is also very difficult to extrapolate to pile driving from studies using other types of signals (e.g., pure tones, air guns) because such signals are not analyzed or described in a format that can be interpreted in terms of a pile-driving signal (e.g., acoustic energy flux or acoustic intensity over time). Moreover, signals used in other studies often differ markedly from those emitted by pile driving in terms of duration, rise and fall times, and frequency content (e.g., Yelverton et al. 1975; Hastings et al. 1996; McCauley et al. 2003). Thus,

specific signal components that affect fish may be very different in, for example, a study that uses continuous white noise vs. a study that uses impact sound exposures such as generated during pile driving.

The authors of this report conclude that it is imperative to initiate studies that start with very basic questions about the effects on fishes from exposure to pile driving sound. Table 1 ([Exhibit 8A]...) *gives an overview of the types of studies that need to be accomplished to better understand the issues of pile driving and the biological effects caused by such signals. Note that this table is presented in much greater detail in Section V of this report (Table 5, page 49), and summarized in Figure 9 (page 73).*

It is important to note, as discussed in detail in Section V (page 42), that the body of scientific and commercial data currently available is inadequate for the purpose of developing more than the most preliminary scientifically supportable criteria that will protect fish from exposure to pile driving sound. As a consequence, such criteria are not proposed in this report. Instead, the information from earlier blast and pure tone studies has been used to develop recommendations for interim guidance to address physical injury and mortality and damage to auditory sensory cells, while recognizing the need for well-controlled studies to provide clear direction for development of scientifically supported criteria. It is critical to note, however, that <u>*the interim guidance developed must be used with the utmost caution*</u>*, and that such guidance should not be used for any other signal than pile driving. The interim guidance recommended for pile driving is only applicable to that source and not for other sources such as air guns or sonars because it is based on results of effects studies that had received signals with temporal and spectral characteristics similar to those of pile driving signals.* [Emphasis in original]

In elaborating on the concept of a dual "peak" and "sound exposure level (SEL)" criteria, this paper states:

Because sound is a form of energy, the damage potential of a given sound environment will depend not only on its level, but also its duration. For constant sound levels this is a straightforward analysis, but if sound level varies it must be sampled repeatedly over a well-defined time window (or sampling period). In human studies, these samples have been averaged together to form a single value known as the Equivalent Continuous Sound Level or L_{eq}*, which has the same energy content as a varying sound level.*

A common alternative energy metric to the L_{eq} *is the sound exposure level (SEL), which is defined as the constant sound level acting for one second, which has the same amount of acoustic energy as the original sound. An SEL measurement is often used as an energy metric for a single acoustic event. Because all SEL measurements are normalized to a one second time interval, it may be used to compare the energy content of different exposures to sound. SEL*

> *is calculated by summing the cumulative pressure squared (p^2) over time and is often used as an indication of the energy dose. The unit for SEL is dB re 1μPa²-s.*
>
> ...
>
> *In the case of pile driving, there is rarely a plane wave because the sounds are produced in shallow water near shore with numerous boundaries and may interact with sound traveling in the substrate. These conditions produce a very complex sound field that does not have a simple relationship between sound pressure and particle velocity.*

Interim Criteria. The Working Groups second product, an "interim criteria," paper, while noting the above uncertainties, attempts to arrive at a guideline for consideration, by among other entities, regulatory agencies, pending further research clearly and admittedly needed. It published an initial draft of an "interim criteria" paper on February 28, 2006, received fairly extensive comments, and published a second draft on May 13, 2006. Both drafts propose/recommend the same dual criteria, which, again, are intended to take into account both "SEL" and peak levels (recommended to be 187 dB (SEL) and 208 dB (peak) (more specifically 187 dB re: 1 μPa^2-sec for Sound Exposure Level threshold, *and* a peak sound pressure threshold of 208 dB re: 1 μPa_{peak} for any single strike.) (See Exhibit 9A for additional technical discussion of sound metrics.) The paper elaborated:

> *In the dual criterion approach adopted here, the SEL value limits the total acoustic energy fish may experience within a single impulsive sound, while the peak sound pressure level protects fish from an especially strong excursion in pressure within the sound impulse. In practice, we recommend that both SEL and peak pressure are measured during pile driving operations and that neither criterion should be exceeded. We note the likely relevance of some means of accounting for the cumulative effects of multiple exposures and the fact that peak pressure fails entirely in this regard.*

In commenting on the Working Group's initial "interim criteria" paper, NOAA Fisheries questioned a number of the paper's assumptions and extrapolations. NOAA Fisheries considered the proposed criteria arbitrary and unwarranted (based on the available science), stating: "As it now stands, such a criterion can be viewed as being arbitrary, not based on the available science, and certainly not being conservative." The primary concern expressed by NOAA Fisheries was how cumulative thresholds are set and exposure levels determined. NOAA Fisheries also noted that during one of the San Francisco Bay pile driving caged fish studies "...the data strongly suggest that fish exposed to single-strike SELs that are substantially less than the proposed 187 dB suffered considerable injury" and that "the data strongly suggest that the proposed SEL criterion is not protective of fishes and that some other method of summing the sound exposure is required."

In attempting to address these comments the second iteration of the *Interim Criteria* paper reiterated the same proposed dual criteria, but emphasized that:

> *At this point, we know nothing of the accumulation of effects resulting from strikes that are variably spaced in time. Consequently, predicting the cumulative effects of multiple pile strike exposures remains speculative. It is clear that future research, as discussed in the appendix, will be needed to add the very important variables of multiple strikes and inter-strike intervals into subsequent exposure criteria.*

Notwithstanding NOAA Fisheries' comments, the interim criteria paper concluded:

> *Based upon the best available science, and using conservative estimates, we conclude that it is reasonable and appropriate at this point to use a combined interim single strike criterion for pile driving received level exposure; an SEL of 187 dB re: 1 μPa^2 •sec and a peak sound pressure of 208 dB re: 1 μPa (peak) as measured 10 m from the source. We have considered the important issue of cumulative effects of multiple exposures, but emphasize the current absence of any empirical information which would allow cumulative effects to be taken into account. Our expectation is that our interim criteria will change as we obtain more data on effects of pile driving and other sounds on fishes. However, since these values, based upon current data, are conservative, they are far more realistic than the value of 180 dB re: 1 μPa (peak) which is currently in use, and for which there is no scientific justification.*

The paper's summary of the needed additional research is attached as Exhibit 10A.

Commission Conclusion. In addition to the lack of consensus at this time over whether and how any interim criteria would be relied upon, further lack of consensus exists between NOAA Fisheries and Caltrans on the applicability of these criteria to the subject project, including, if they are applicable, how they would be applied and measured. In addition, CDFG requests resolution of this issue before determining appropriate mitigation levels. NOAA Fisheries has provided a draft Biological Opinion to Caltrans and FHWA (which the Commission staff does not have access to as of this date), and it is unclear whether these issues will be resolved prior the upcoming-scheduled June 2006 Commission meeting. There is also a dispute between the Caltrans and NOAA Fisheries as to whether sonar monitoring of fish behavior should be deployed. Caltrans prefers direct observation by human monitors; NOAA Fisheries argues that new sonar technology make it possible to directly observe fish responses at a very refined scale (little is known about sublethal behavioral responses of fish exposed to pile-driving sound pressure) Consequently, other than in general terms as discussed in the previous consistency certification, the Commission does not have sufficient information at this time to know what mitigation measures will be proposed, and what monitoring will be conducted. Caltrans has repeatedly requested a Commission hearing by June 2006, citing the urgency of their administrative commitments to put the project out to bid soon, as well as the public safety benefits of replacing the seismically deficient bridge. Accordingly, the Commission believes these measures must be brought back to it for a public hearing and Commission action to ensure the proposed project is fully consistent with the applicable marine resources, fisheries, and environmentally sensitive habitat policies of the Coastal Act.

The Commission is clarifying in its conditions areas that need to include further details (including those plans that will need further public hearings). The conditions require Commission review of acoustic footprint monitoring plans, fish damage/behavioral monitoring plans, and offsite fisheries enhancement/mitigation plans, and Commission staff review of marine mammal monitoring plans. The conditions also clarify that the "acoustic footprint" monitoring plan will need to be clarified to provide at least as many data collection points as Caltrans provided in its Noyo River Bridge acoustic monitoring program (which contained hydrophone arrays at six different locations from the pilings (in that case, ranging between 12 m (meters) and 150 m). For the proposed project, Caltrans has proposed hydrophone arrays at 10 m, 100 m, "and various other [unspecified] locations." The above-discussed "Effects on Fish" paper notes that "Thus it is possible that at certain locations received levels of sound could be higher further from the pile than at locations closer to it and this has been observed in some monitoring data (Caltrans 2001)." Indeed, as the Commission is well aware and has observed (e.g., Mobil pier demolition acoustic monitoring), shallow water acoustics are quite complex. Substantially more than 2 locations (10 m and 100 m) are needed to verify the sound field.

The marine mammal monitoring and avoidance plan is generally adequate and can thus be delegated to Commission staff review, with one clarification: the Commission is adding a "visibility" requirement/clarification into the condition. Thus, as conditioned, this would be subject to Executive Director review and approval, and the plan must provide that, at the beginning of a day of pile driving, when biological monitors observe for marine mammals, if the visibility distance is less than the preclusion area, pile driving may not commence until visibility has improved and the observer can verify that the area is clear of marine mammals. The Commission concludes that, as conditioned (through Special Conditions 1 – 5 attached hereto, including further Commission review and analysis of acoustic footprint monitoring plans, fish damage/behavioral monitoring plans, and offsite fisheries enhancement/mitigation plans, the project would be consistent with Sections 30230, 30233, 30234, 30234.5, and 30240 of the Coastal Act.

E. Water Quality

Section 30231 of the Coastal Act provides that:

> ***The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.***

The Ten Mile River bridge replacement project is located 0.4 miles upstream from the mouth of the river at the Pacific Ocean. The 120 sq.mi. watershed consists of hilly mountainous terrain predominately forested with Coastal redwood, Douglas Fir, and Tanoak. Roadway drainage in the project area is currently conveyed within drainage swales adjacent to both sides of Hwy.1, where it is then conveyed through culverts to slopes that drain down to Ten Mile River. The proposed project holds the potential to adversely impact water quality in the Ten Mile River and its estuary due to construction-related activities and runoff from completed project features (e.g., the bridge deck, highway approaches, cut and fill slopes, and areas undergoing revegetation). The Ten Mile River is currently on the State Water Quality Control Board's 303(d) list of impaired water bodies due to sediment levels; the river's total maximum daily load (TMDL) was established by the U.S. EPA in December 2000. The North Coast Regional Water Quality Control Board (NCRWQCB) is developing a *Sediment Waste Discharge Prohibitions and Action Plan for the Control of Sediment Waste Discharges* for the Ten Mile River to address man-made sources of sediment waste discharges from new projects and existing sources.

The consistency certification, and in particular the July 2004 *Storm Water Date Report*, addresses the project's Design Pollution Prevention BMPs, measures incorporated into the project at the early design phase to minimize adverse water quality effects from the completed project:

> ***Proposed and improved cut and embankment slopes are 1:2 or flatter on the east side and 1:4 or flatter on the west side. The impervious surface (paved shoulder) area added (cumulative) to the project is less than 0.1 ha (0.25 acres), and is offset by the flatter cut slopes, thus resulting in an insignificant hydraulic difference in flow volumes or rates.***
>
> ***Cut and fill slopes will require temporary and permanent measures be taken to provide protection from erosion. Erosion control planting will be recommended by the District Landscape Architect.***
>
> ***Two existing RCP culverts (one north and one south of the bridge) will either be extended to move the outlets from the clear recovery zone or replaced along the new alignment. Downdrains will be added at the bridge abutments.***
>
> ***Preservation of existing vegetation has been maximized on the project.***

The consistency certification next examines the control of potential construction-related water quality impacts, primarily from vegetation removal, grading, and stockpiling of excavated materials for later use as

backfill. The October 2004 *Biological Assessment* for the project states that:

> ***Since the project will result in the soil disturbance of greater than one acre, construction activities will be regulated under Caltrans' Statewide General National Pollutant Discharge Elimination System (NPDES) Permit. NPDES permits for storm water discharges must meet all applicable provisions of section 301 and 402 of the Clean Water Act (CWA) . . . Caltrans has a revised Storm Water Management Plan (SWMP, May 2003) that includes new and revised best management practices (BMPs) categories, including:***
>
> > ***1. Design Pollution Prevention BMPs - Preservation of existing vegetation, concentrated flow conveyance systems, slope/surface protection, etc;***
> >
> > ***2. Treatment BMPs - Infiltration and detention basins, traction sand traps, biofiltration, etc.;***
> >
> > ***3. Construction Site BMPs - Temporary soil stabilization and sediment control, non-storm water management, and waste management; and***
> >
> > ***4. Maintenance BMPs - Litter pickup, materials handling, waste management, street sweeping, etc.***

In addition, the July 2004 *Storm Water Data Report* prepared for the Ten Mile River bridge replacement project states that the total disturbed area for the project is 10.85 acres, and because this disturbed area is greater than 1.0 acres, a Storm Water Pollution Prevention Plan (SWPPP) must be prepared for this project during the final design phase.

Caltrans reports that while the final list of specific construction BMPs for the Ten Mile River bridge replacement project is not yet developed, the following classes of BMPs are considered minimum requirements (unless later demonstrated to not be appropriate for a particular project):

- **<u>Temporary Soil Stabilization</u>: preservation of existing vegetation, hydraulic mulch, hydroseeding, soil binders, straw mulch, geotextiles, plastic covers, erosion control blankets/mats.**
- **<u>Temporary Sediment Control</u>: silt fence, fiber rolls, street sweeping and vacuuming, storm drain inlet protection.**
- **<u>Non-Storm Water Management</u>: illicit connection/illegal discharge detection and reporting, vehicle equipment and cleaning, vehicle equipment and fueling, vehicle and equipment maintenance.**

- **<u>Waste Management and Material Pollution Control</u>: material delivery and storage, material use, stockpile management, spill prevention and control, solid waste management, sanitary/septic waste management.**

The final list of construction BMPs will be incorporated into the project contract during the final design phase, depending on various site-specific factors and expected phases of project construction. Caltrans has committed to submitting the SWPPP and final list of construction BMPs to the Executive Director for his review and concurrence prior to the start of construction at Ten Mile River.

The consistency certification next addresses runoff from the proposed new bridge:

> ***Due to the natural topography of the project vicinity, the bridge needed to be designed with a vertical sag, resulting in storm water draining towards the center of the bridge. Given the necessity of this design, the California Regional Water Quality Control Board (CRWQCB) submitted a letter to Caltrans (see attached letter) approving the drainage of storm water falling on the bridge directly into Ten Mile River*** **[through vertical deck drains and/or scupper drains].** ***The CRWQCB is requiring that water that falls on the bridge approaches must be diverted to a biofiltration source. . . .*** **[Exhibit 21]**

A June 2, 2005, memo from Caltrans' North Region Office of Environmental Engineering provided background information on the selection of this drainage alternative for the bridge:

> ***Caltrans investigated the potential for incorporating drop inlet inserts into the bridge deck drain inlet. However, there are no drop inlet inserts currently available on the market that are designed for use in bridge deck drains.***
>
> ***Caltrans investigated whether storm water could be collected from the bridge deck to discharge locations outside of the stream channel for treatment on land. An engineering study concluded that this alternative would require a complex set of pipe networks but that due to bridge geometry the collected storm water could not reach the upland discharge points.***
>
> ***Caltrans next investigated seeking approval from the RWQCB to allow storm water discharge off the bridge deck into the river. In August 2003, the RWQCB concurred that collection of storm water from the bridge deck would not be feasible without a significant vertical realignment of the bridge structure. The NCRWQCB conditioned its***

concurrence with the requirement that storm water falling on bridge approaches be treated with biofiltration.

To that end, Caltrans has proposed the installation of biofiltration strips at three sites adjacent to the western edge of Hwy.1 to treat storm water runoff:

For biofiltration strips, we chose available areas that will provide a broad vegetated surface that receives and discharges runoff as sheet flow. Caltrans has no minimum or maximum slope criteria for biofiltration strips but hydraulic sheet flow criteria indicates that the maximum length in the direction of flow is approximately 300 feet and may be much less due to flowline grades and surface roughness. Up to this limit biofiltration strips should be as long in the flow direction as site conditions allow. Other considerations are having design side slopes as long and as flat as ROW and maintenance requirements allow. The east side is not wide enough to incorporate bio-strips. The bio-strips **[on the west side of Hwy.1]** ***south of the bridge are 361 and 354 sq.yds., and the bio-strip north of the bridge is 1683 sq.yds.***

The proposed Ten Mile River bridge replacement project contains design features to minimize water quality impacts, and will include an up-to-date package of construction-related best management practices to ensure that the multi-year construction and demolition activities will not degrade water quality in the Ten Mile River. The Commission's water quality staff reviewed the project's water quality protection measures – including the technical information supporting the proposed bridge drains and biofiltration strips – and concluded that the project will not lead to adverse water quality effects to the Ten Mile River and the biological resources of its estuary. Caltrans has committed to submitting the project's SWPPP and final list of construction BMPs to the Executive Director prior to the start of construction at Ten Mile River. This will allow the Commission staff an additional opportunity to review and comment on the adequacy of the final water quality protection measures. Therefore, the Commission finds that the Ten Mile River bridge replacement project is consistent with the water quality policy of the CCMP (Section 30231 of the Coastal Act).

The Commission additionally finds that because Caltrans relies on a subsequently-selected contractor to prepare the Storm Water Pollution Prevention Plan(SWPPP) "downstream" of the project bidding, Special Condition 12 (Water Quality Protection Plan/SWPPP) is necessary to ensure that prior to issuance of the coastal development permit, Caltrans submits for the review and approval of the Executive Director, a Water Quality Protection Plan that will form the template for the SWPPP, and against which the Executive Director will subsequently review the contractor-prepared SWPPP for consistency with the Water Quality Protection Plan and for the adequacy of the SWPPP/Best Management Practices to carry out the Water Quality Plan. Special Condition 12 also specifically incorporates the requirement that while dewatering

operations are underway that pump water out of areas subject to turbidity or the placement of wet concrete, the water shall be pumped to a holding tank and tested to ensure that it meets the water quality standards deemed protective of fish and water quality, including pH levels, before the pumped water is discharged back into the Ten Mile River.

In addition, the Commission notes that Caltrans has not ruled out the use of timber temporary piles. Therefore the Commission finds it necessary to attach Special Condition 10 (Temporary Piles), which requires that no creosote treated piles shall be placed in any area of the project site where chemicals leaching from the piles may reach the waters of the Ten Mile River, that piles used to construct the temporary trestles shall be of concrete, steel, composite, untreated timber, or timber treated with a wood preservative approved by the Department of Fish and Game for use in marine waters, and that all temporary piles placed shall be pulled up and completely removed without digging them out or cutting them off at the mudline.

Special Condition 7 (Construction Related Requirements), Special Condition 8 (Erosion Control and Revegetation) and Special Condition 9 (Drainage Structure Final Plan) contain a number of requirements protective of water quality, including the obligation to properly maintain drainage structures and repair any erosion that may result from the failure of such structures. The Commission finds it necessary to impose these conditions to ensure that the water quality of the Ten Mile River and other coastal waters are not polluted by runoff transporting excess sediment and that construction wastes and other debris do not reach the waters of the river.

The Commission finds for all of the reasons set forth above that the proposed project, as conditioned, is consistent with the Chapter 3 policies of the Coastal Act protective of water quality.

F. Environmentally Sensitive Habitat Area

The Coastal Act provides the following:

Section 30240.

(a) Environmentally sensitive habitat habitat values, and only uses dependent on those resources shall be allowed within those areas.

(b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.

In addition to the wetland and other marine resources examined in Section B above, additional environmentally sensitive resources are present in or

adjacent to the project area uplands south of Ten Mile River which could be affected by construction activity (the north bank of the river rises sharply and is minimally vegetated). As reported in Caltrans' October 2004 *Biological Assessment* prepared for the California Department of Fish and Game (CDFG), the federal and state endangered Menzies' wallflower (*Erysimum menziesii*) is a low-growing, succulent, biennial to short-lived perennial herb that occurs near the south side of the logging haul road on the south bank of Ten Mile River. The federally endangered and state threatened Howell's spineflower (*Chorizanthe howellii*) is a flowering, annual herb in the buckwheat family, and is discontinuously distributed within the dunes south of Ten Mile River. Both these plant species are endemic to coastal dune habitats of central and northern California. In Caltrans' August 24, 2005, memo to CDFG, it was reported that two additional sensitive plant species were observed in the general project vicinity. Lyngbye's sedge (*Carex lyngbyei*) was observed along both banks of the river, primarily upstream of the bridge. Round-headed Chinese houses (*Collinsia coymbosa*) was observed south of the river and over 400 feet downstream of the existing bridge and will not be affected by the project. The consistency certification reports that migratory birds, including cliff swallows and purple martins, nest and breed on the existing bridge. Sand dune habitat extends from near the southern end of the existing bridge westward to the ocean shoreline in MacKerricher State Park, and in locations provides nesting habitat for the endangered Western snowy plover.

Construction of the proposed project could adversely affect the aforementioned upland sensitive resources, due primarily to grading for realignment of the Hwy.1 to the new bridge, clearing of vegetation in the realignment corridor, and construction of trestles, falsework, and access roads to support new bridge construction and existing bridge demolition. However, the consistency certification and Caltrans' August 24, 2005, memo to CDFG documents provide the following documentation that the project will avoid sensitive habitat areas:

> ***Howell's spineflower. The project had originally proposed to use an area near the existing population of Howell's spineflower to access the existing bridge during the demolition phase of the project. It has now been determined that the previously discussed access road leading from the haul road will not be used. In addition, construction access for demolition of the existing bridge is now confined to 48 feet west of the existing bridge. This western boundary of the work area avoids all of the existing spineflower as well as the area where the species could expand its distribution (in the "open" area between the existing bridge and the plant's current population.***
>
> ***Menzies' wallflower. As discussed above, construction access for demolition of the existing bridge will be confined to 48 feet west of the***

existing bridge. The western boundary of the work area avoids all of the existing wallflower as well as the area where the species could expand its distribution (in the "open" area between the existing bridge and the plant's current population).

Lyngbye's sedge. The plant may be temporarily affected by the placement of trestle piles. Any impacts to the species will be minor and temporary. It is anticipated that any depressions left in the substrate subsequent to removal of temporary piles will quickly fill in during high flows along the river's banks and be repopulated with the adjacent species, including Lyngbye's sedge.

In addition, the populations of Menzies' wallflower and Howell's spineflower will be fenced off to prevent personnel, equipment, or materials from entering these areas throughout the construction and demolition period. As discussed in Section B above, all wetland habitat disturbed during project construction will be restored to pre-project conditions, either through natural re-vegetation or planting by Caltrans. Populations of Lyngbye's sedge adversely affected by construction would be included in these wetland restoration efforts.

Nesting for migratory and resident birds will be protected during construction and demolition activities (Exhibits 22 and 23). Caltrans provides that:

- **Migratory birds are protected under the Federal Migratory Bird Treaty Act. The Ten Mile River bridge supports a large colony of cliff swallows that nest primarily under the overhang of the existing bridge. The new bridge would have a ledge (i.e. overhang) that would allow swallows to nest as they currently do on the existing bridge. In addition, the new bridge would have holes underneath the bridge deck similar to those found under the existing bridge. These holes would be available for nesting by purple martins and other cavity nesting birds.**

- **In order to protect bridge nesting birds during demolition of the existing bridge, the construction and removal of temporary falsework and/or temporary platform to catch the bridge pieces as well as the removal of the superstructure itself, would be restricted to August 1-March 31 of any year of construction. The falsework and platform are confined to this work window (when cliff swallows are not present) given that they could provide angles for the birds to construct a nest.**

- **Bridge demolition may extend beyond March 31 if birds have not begun nesting yet and depending on the type of work to be done and the time required to finish it. Additionally, if nesting is shown to be**

complete (fledglings are not detected), prior to August 1, demolition of the bridge may begin earlier than August 1.

- **Riparian vegetation on the project site also supports nesting migratory bird species as well as resident bird species. Riparian vegetation that would be affected during the construction project would be cleared between September 1 and February 28 of the first year of construction to avoid affecting any nesting activity.**

The *Ten Mile River Bridge Revegetation Plan* (September 2005) includes measures that will ensure that environmentally sensitive habitats adjacent to construction areas will continue to be protected against adverse effects from ground disturbance:

- **Restoration of self-sustaining native vegetative cover, appropriate to the habitat type, across the approximately 1.8 acres of upland habitat impacted by grading and construction, and including restoration of the existing maintenance turnout at the south end of the bridge and all existing roadbed areas outside of the new alignment of Hwy.1 north and south of the bridge.**

- **Where the project results in cut and/or fill areas, the top six inches of native topsoil will be removed and stockpiled. Salvaged topsoil will then be placed at a minimum two inch depth on all new fill slopes and in areas where existing roadway is to be abandoned and obliterated (asphalt paving and base removed, roadbed then ripped to a depth of ten inches). Replacement of native topsoil will prepare the area for planting.**

- **Adjacent to the roadway, revegetation will consist solely of erosion control effort and hydroseeding. In these upland areas the seed mix will be comprised of grass and wildflower species native to the project site.**

In conclusion, the proposed bridge replacement project is designed to minimize significant adverse effects on environmentally sensitive habitat within and adjacent to the project zone. No construction work or disturbance will occur in areas where federal- and state-endangered plant species occur; fencing will be installed prior to the start of construction to prohibit any entry into these mapped areas throughout the multi-year construction period. Nesting for migratory birds will be protected during bridge construction and demolition activities. The proposed bridge includes design elements that will allow cliff swallows to nest as they do on the existing bridge. Demolition of the existing bridge will occur between August 1 and March 31 when cliff swallows are not present. Clearing and removal of vegetation and riparian habitat will occur between September 1 and February 28 of the first year of construction to avoid adversely

affecting nesting birds in the project area. The project revegetation plan includes provisions for replanting and restoring all disturbed areas to native vegetative cover, restoring all roadbed areas outside the new alignment of Hwy.1, and monitoring and remediation measures to ensure that environmentally sensitive habitats are restored to optimum, pre-project conditions in a timely manner. Therefore, the Commission finds that the Ten Mile River bridge replacement project will protect environmentally sensitive habitat and is consistent with the environmentally sensitive habitat protection policy of the CCMP (Section 30240 of the Coastal Act).

As can be seen from the excerpts from the adopted findings for the Commission's conditional concurrence with CC-074-05, Caltrans has undertaken a number of revisions of their draft revegetation plan, through the most recent plan dated September 2005, received by Federal Consistency staff September 20, 2005. The final plan remains somewhat vague, however about specific measures such as a weeding schedule ("early weed control will be implemented until planted materials are well established"), which should be prepared in detail as part of the plan and should require that weeding take place every other month for the first year and quarterly thereafter according to Commission's Senior Staff ecologist who reviewed an earlier draft of the revegetation plan in August 2005 and made a number of specific recommendations for revisions. Dr. Dixon also recommended that specific criteria be developed to measure success, including height, new growth, and reproduction, and that success criteria be improved (only plant health or vigor was cited in the Caltrans September 2005 draft). Other recommendations included expanding success criteria that relate to species diversity and to percent ground cover and abundance of non-native plants, and developing a sampling plan with a prescribed statistical analysis plan, and use of a reference site to determine the sampling replication necessary to detect specified biologically significant differences. The Commission therefore imposes Special Condition 8 (Revised Erosion Control and Revegetation Plan) to ensure that the recommendations of the Commission staff ecologist are incorporated fully in the final plan for the review of the Executive Director.

The Commission also finds it necessary to impose Special Condition 7 (Construction Related Responsibilities), Special Condition 13 (Biological Monitoring), and Special Condition 21 (Final Disposal Plan) which, fully implemented, will ensure that site activities are undertaken in a manner that avoids unauthorized access to sensitive habitat areas, that a qualified biological monitor oversees project activities that may affect environmentally sensitive habitat or species, and that debris, graded spoils, and other wastes generated by the project are disposed of in a manner that does not adversely affect sensitive resources.

Conclusion: The Commission finds that the proposed project, as conditioned, is consistent with the Chapter 3 policies of the Coastal Act protective of environmentally sensitive habitat and species.

G. Visual Resources

The Coastal Act provides the following:

> ***Section 30251. The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas. New development in highly scenic areas such as those designated in the California Coastline Preservation and Recreation Plan prepared by the Department of Parks and Recreation and by local government shall be subordinate to the character of its setting.***
>
> ***Section 30254. New or expanded public works facilities shall be designed and limited to accommodate needs generated by development or uses permitted consistent with the provisions of this division; provided, however, that it is the intent of the Legislature that State Highway Route 1 in rural areas of the coastal zone remain a scenic two-lane road . . . .***

The proposed bridge will be located in an area of rural Mendocino County marked by spectacular, expansive coastal views. The current bridge proposal will serve the dual purpose of providing for the Coastal Trail and providing a safe viewing destination for coastal visitors – including handicapped coastal visitors – who would be attracted to the bridge to enjoy the spectacular views available from the deck. The photograph of the bridge and environs that is available on the Coastal Records Project site shows the panoramic coastal view potential that will be available on the new bridge deck. For those with internet access, the website for the Ten Mile River Bridge is: http://www.californiacoastline.org/cgi-bin/image.cgi?image=11273

Caltrans' new proposal for the bridge design includes an ADA-compliant corridor separated from traffic by a crash-tested guard rail. This design ensures that the views available on the existing bridge deck remain available to the public, but are significantly improved through the enhanced safety features of the proposed project. In addition to making the Coastal Trail corridor wheelchair-safe, the use of the guard rail and widened corridor (5-ft.-wide) will make the bridge safely available to the coastal visitor who is frail, shepherding small children, or pushing a stroller. As stated previously in the public access section, the Commission finds it necessary to impose Special Condition 23 (Final Plans) to ensure that these features are finalized in the project plans.

Caltrans has also revised the proposal to include a pedestrian outer rail of the "picket" style that was installed on the Noyo Bridge in Fort Bragg. That rail will be approximately 48 inches high. The pedestrian corridor will be five feet wide, and on the inner edge a guard rail (ST-10 style) 31 inches high and 18 inches wide will separate the now-proposed 6-ft.-wide paved traffic shoulder from the pedestrian corridor. The outer

rail on the eastern (upstream) side of the bridge is still proposed as the ST-20 type with the see-through horizontal metal rails with the additional rail necessary to achieve the 54-inch bicycle safety height that Caltrans believes is necessary. Caltrans also proposes approximately 600 linear feet of guard rail off the bridge, along the realigned highway section subject to the PWP/Specific PWP Project, and two 24-foot-long QuadGuard crash cushions, one on the northwest side of the bridge, and one on the southwest side of the bridge. These would be installed at the end of the bridge. The Commission's review of the overall design elements of these features will ensure that a final project design compatible with the project's highly scenic setting is approved, pursuant to the requirements of Special Condition 18 (Final Rail Design). The Commission also finds it necessary to impose Special Condition 19 (Permanent Signage/Signal/Lighting Plan; Limitation on Future Development) to ensure that nonessential signage, displays, or other accessory devices are not placed on the bridge where such features could interfere with the views from the bridge. In addition no permanent lighting on the bridge is proposed by Caltrans and Special Condition 19 prohibits the installation of lighting features (such as overhead spotlighting) on the bridge unless Caltrans obtains an amendment to CDP 1-06-022 for such development. Special Condition 19 would allow very minor lighting that is the minimum necessary for essential safety purposes).

As discussed in the public access section, Caltrans continues to meet with the Commission's "Road's Edge" Subcommittee to resolve visual impact concerns associated with railings and other design features associated with roadway edges. The final design recommendations of this subcommittee would be incorporated into an amendment of the coastal development permit and would be returned to the Commission for final public action, pursuant to Special Condition 18 (Final Rail Design). Therefore, the Commission's review of the final design elements need not be resolved at the present time.

As cited above, the Coastal Act and specific policies of the LCP require Highway 1 to remain a scenic, rural, two-lane road. The Ten Mile River Bridge and environs are designated Highly Scenic in the certified LCP, and therefore the project location fully meets the test of being a Highway 1 segment in a scenic, rural, two-lane location that must be preserved as such. The Commission has found in the past that the operative guidance of Section 30254 of the Coastal Act is that the visual amenities – the scenic charm and character of the highway – are what the policy seeks to preserve. Thus the Commission must weigh carefully the "creep" of widened paved areas that while strictly speaking are not additional lanes, include enough additional paved surface that the visual affect is the same. The Commission finds in the case of the current Ten Mile Bridge replacement proposal, that the addition of the pedestrian corridor provides a significant amenity for the enjoyment of the spectacular views of the area, and is actually a component of the Coastal Trail, for pedestrians – rather than an additional highway lane. While the paved shoulders would be wider than the 4-ft.-wide standard applicable in the County's certified LCP, the affected portion of the Mendocino Highway 1 route is limited mostly to the bridge deck, where the difference in width on such a long bridge is less visually apparent than might otherwise be the case. In addition, the highway shoulder tapers from 6-ft.-wide at the ends of the bridge back to the width of the existing

highway at the point of conformity along the shortest overall transition length that Caltrans designers could manage consistent with applicable safety standards.

Finally, Special Conditions 6 (Permit Obligations), 7 (Construction Responsibilities), 8 (Erosion Control and Revegetation Plan), 9 (Drainage Structure Maintenance Responsibility), and 15 (Authorized Development Only), fully implemented, will ensure that project activities and long term maintenance are undertaken in a manner fully protective of the visual resources associated with the project site and environs.

Therefore, for all of these reasons, the Commission finds that the proposed bridge design, as conditioned to require permanent protection of public access to the pedestrian corridor, to limit extraneous signage and lighting and allow only the minimal signage and lighting necessary for safety, t return the bridge rail design to the Commission for final consideration, and to construct and maintain the project in a manner protective of visual resources, will combine to ensure that the proposed project as conditioned is consistent with the Chapter 3 policies protective of visual resources and of the rural, two-lane character of Highway 1 in scenic coastal areas.

The text below contains the adopted findings for the Commission's conditional concurrence with CC-074-05 regarding visual resources.

1. Background. The Ten Mile River – along with its estuary and adjacent coastal dunes and uplands that are viewed by travelers along Highway 1– is an outstanding example of the type of scenic area where new development should be subordinate to the setting (Exhibit 4). The expansive and rolling landscape, the backdrop of the Coastal Range and the distant Pacific Ocean, and the minimal level of residential development at the Hwy. 1 crossing of Ten Mile River is the type of setting for a stretch of rural two-lane Hwy. 1 that the Coastal Act was designed to protect.

The proposed bridge replacement project could adversely affect visual resources – both temporarily and permanently – at and adjacent to the project site due to temporary construction activities (e.g., access roads, staging areas, vegetation removal, grading, trestles, falsework, equipment, demolition activity, aerial transmission lines, cut and fill slopes undergoing revegetation) and design features of the new bridge (e.g., wider bridge deck, wider paved shoulders on the Hwy.1 approaches to the bridge). However, the project also includes elements that will improve visual resources at and adjacent to the project area (e.g., removal of overhead transmission lines that cross the river just east of the existing bridge, reduced number of piers supporting the bridge, a haunched girder design, improved see-through characteristics of the bridge railing).

The consistency certification states that the bridge replacement project was designed to avoid and minimize potential effects on visual resources:

> ***This included an analysis of bridge alignment, bridge abutment slope angles, and bridge railing types, resulting in a design that would minimize tree impacts, and provide a low profile and unobtrusive structure as possible. Trees, shrubs, and wetland vegetation removal would be required. Four cypress trees and one willow would be removed south of the bridge on the east side of the highway, and one pine would be removed north of the bridge on the east side of the highway.***
>
> ***Replanting of native trees and vegetation (including in the temporarily affected and newly created wetland areas) would occur . . . .***

The potential visual resource impacts associated with the Ten Mile River bridge replacement project were analyzed further by Caltrans in its June 2005 *Ten Mile River Bridge Visual Assessment.* This document provides a summary of present conditions in the project area:

> **. . . The overall visual quality of this area is extremely high; generally speaking the viewshed of the Ten Mile River is intact as far as development is concerned . . . In its current condition, the Ten Mile River Bridge seems to fit in well with the surrounding landscape. The existing bridge is a simple structure and allows highway travelers a variety of views as they approach and travel across the bridge. Highway travelers get a unique perspective when approaching the bridge from the south as they approach the bridge at a higher elevation, and at such an angle the bridge profile is seen with the river outlet and the coast as a backdrop . . . .**
>
> ***The project also borders MacKerricher State Park . . .* [There] *are areas within the boundaries of the State Park that have views of the project area.***

2. <u>Impacts and Mitigation</u>. The *Visual Assessment* notes that the new bridge would be located just east of the existing structure and would generally mimic the profile of the existing bridge, although the new bridge would be several feet higher at the southern end and several feet lower at the northern abutment. The Hwy. 1 southern approach will be realigned to the east by approximately 65 feet in order to connect with the new bridge. As a result, the roadway must be extended 340 feet northward on a new fill slope built across a portion of the bluff that slopes down to the haul road parallel to and south of Ten Mile River.

The *Visual Assessment* reports that the proposed bridge will include a "haunch girder" type design rather than the typical "box girder" design (Exhibits 24 and 25):

> **The design of the structure is very important to the visual impacts any bridge would pose. The Caltrans standard is a box type girder with round piers . . . A haunch girder system with rectangular piers were used in all simulations and is recommended in this situation. The haunch girders make the structure seem less massive through the tapered girders and chamfered corners. This type of design seems to be more organic, and makes the bridge lines softer. A subtle design is best suited given the tranquil and undeveloped setting that makes this location unique.**

The *Visual Assessment* next describes the approach used to assess the potential visual resource impacts generated by the proposed project:

> **The project area was analyzed by assessing the different viewer groups, determining where their views of the project occur, and to what extent those views will be affected. Viewpoints and viewers were identified and described. Photo simulations were done for selected views to show existing compared to proposed conditions in order to illustrate impacts both visually and descriptively.**

Two of the viewer groups are comprised of residents living in close proximity to the bridge on the north bank of the river and users of private roads and lands south of the river. The remaining three groups are: (1) all recreational users of the Ten Mile River corridor (i.e., anglers, boaters, nature enthusiasts, etc.); (2) users and viewers from MacKerricher State Park, as there are several places within the park with views of the project area; and (3) north and south bound travelers on Highway 1, including those in vehicles and on bicycles.

Based on the design of the replacement bridge and the eastward realignment of the Hwy. 1 southern approach to the new bridge, the *Visual Assessment* states that the main visual resource impacts to the three aforementioned viewer groups from public lands, waters, and roads are caused by the fill slope at the south approach and the wider bridge deck:

> ***Impacts to* [the recreational users of the river] *will vary depending on the vantage point of the particular user. In general, this alternative would introduce a longer bridge and a north-facing fill slope to the east of the existing bridge. The fill would be noticeable to viewers in the river corridor and would displace mature vegetation. The longer and thicker structure may be more visibly more intrusive than the existing bridge, but the new structure would have fewer supports in the river and longer spans . . . .***
>
> ***There are areas within the MacKerricher State Park with views of the Ten Mile River corridor including the Ten Mile River Bridge. The majority of these views are from the top of a sand dune to the***

> ***southwest of the bridge, although the bridge also can be seen from the beach and the park directly west of the bridge. The Ten Mile River Bridge can also be seen from the Old Haul Road which now serves as a trail in and out of the State Park. The alignment of Alternative C would move the bridge further away from the State Park and would not impact the views from the park users. Although the profile is at a higher elevation it mimics the profile of the existing and would not be a negative impact from this distance. The fill slope may be less visible from this side of the bridge.***
>
> ***Views for the travelers of State Route 1 would be changed significantly. As the bridge is now, highway travelers have fairly clear views of the Pacific Ocean and MacKerricher State Park to the west, as well as the Ten Mile River corridor to the east. The proposed replacement bridge, due to wider shoulders, will reduce views to the east and west of the bridge . . . .***

The *Visual Assessment* recommends – and Caltrans has incorporated into the project – the following mitigation measures to minimize visual resource impacts:

> ***The introduction of the fill slope on the south bluff would pose a mitigable visual impact. Much of the mature vegetation that currently occupies this slope would be removed, along with the mound that now serves to buffer views to the highway from viewers from the north of the river corridor. The slope would extend to the south side of the Old Haul Road.***
>
> ***All earthwork should be done in a manner to help it blend into the surrounding landscape through slope rounding and contour grading. Replanting of the slope would help restore the slope to a similar state and improve the view of the slope. The North Region Landscape Architect has recommended the use of 2:1 (H:V) or flatter on all slopes. This is suggested to maximize the ability for new plants to get established. Revegetation shall be part of this project, in order to restore what vegetation has been lost and to stabilize disturbed areas.***

3. <u>Bridge Railing</u>. The proposed replacement bridge includes installation of the Type ST-20 "see-through" bridge railing. The *Visual Assessment* states that:

> **[Caltrans]** ***North Region Office of Landscape Architecture recommends the Type ST-20 for use on the Ten Mile River Bridge due to its optimal "see-through" capability of 68%. Use of the ST-20 bridge rail will improve views of the Ten Mile River and the middle and background compared to the current bridge rail used on the existing bridge structure. The Type-80 is acceptable for use since there is an***

> ***opportunity for concrete surface treatment which helps the structure blend into the surrounding visual environment. Both railing types accommodate bicycle traffic which is required due to State Route 1 being part of the Coastal Bike Trail. . . .*** **[Exhibit 26]**

The *Visual Assessment* also includes a June 3, 2005, revised memo prepared by the Caltrans North Region Landscape Architect, which further addresses the proposed bridge ST-20 railing and states in part that:

> ***Views to the east from the*** **[new]** ***bridge will include Ten Mile River in the foreground, the coastal plain in the middle ground, and the Coast Range in the background. To the west, Ten Mile River, sand dunes and the beach are visible in the foreground and the Pacific Ocean is visible in the middle and background. Quality of the foreground views towards the west will depend on the level of transparency of the bridge railing selected.***
>
> ***The ST-20 bridge railing type was approved for use in 2004. This railing type provides for optimum visibility of the surrounding landscape. The ST-20 is designed for use on bicycle and pedestrian corridors. The overall structure height including the bicycle railing is 54 inches. The main railing height is 46.7*** **[inches]** ***with four 3 to 4 inch thick horizontal rails and a 2 inch thick bicycle rail above the main rail structure. The bicycle rail is attached to the vertical posts. The concrete foundation is 5.9 inches high. The mostly see through vertical posts are 11 inches thick and are spaced at approximately 9.8 feet. There is a total of 32.2 inch high window between the posts, rails, and foundation. When viewed from the highway, the ST-20 has 68% window area and 32% solid surface.***

The aforementioned June 3, 2005, Caltrans memo also examined potential alternative railings for Ten Mile Bridge:

- ***The Type-80 is 31.8 inches high with a 11.8 inch horizontal concrete rail and a 9 inch high concrete foundation. The 15 inch thick posts are concrete and spaced at 10 feet and there is an 11 inch window between the railing and the foundation. When viewed from the highway, Type-80 has 35% window area and 65% solid surface. A 23.2 inch high bicycle railing will be attached to the top horizontal rail which is a requirement on designated bicycle routes.***

- ***The ST-10 rail is 32.6 inches high with two 4 inch high horizontal steel rails and a six inch high concrete foundation. The steel posts are spaced at 10 feet and there is a 18.7 inch window between the posts, rail and foundation. When viewed from the highway, the ST-10 has 57% window area and 43% solid surface. Although this***

> ***railing provides for the best views of the surrounding landscape, the design does not allow for the construction of a bicycle safety railing . . . The ST-10 rail is designed for vehicular traffic only and is not suitable for pedestrian or bicycle use.*** **(On the Noyo River Bridge, the ST-10 rail separates vehicle traffic lanes from a pedestrian pathway on the bridge and a taller picket railing fence is installed on the outer edges of the bridge deck for pedestrian safety.)**

The Commission also received a comment letter (Exhibit 16) opposing use of the ST-20 railing on the replacement Ten Mile River bridge. The letter includes an attachment specific to Caltrans' proposed Greenwood Creek bridge further south in Mendocino County, but the author states in his letter that, "All of the information, citations, and argument that I make in it are equally relevant to the 10 Mile Bridge." The commenter – while not supporting combination auto-bicycle rails on Hwy.1 rural bridges – states that where such a rail makes sense, a more transparent and lower railing (48 rather than 54 inches) should be designed. Regarding the replacement Ten Mile River bridge, the commenter recommends reducing shoulder widths to four feet, installing a sidewalk on the bridge, installing the ST-10 railing to separate vehicle traffic and pedestrians, installing a newly-designed pedestrian rail incorporating curved and arched elements found on historic Hwy.1 bridges, and incorporating into the project the Commission's 2001 comments to Caltrans on the design of rails for use in scenic coastal areas (Exhibit 27).

During the Commission's discussion of the proposed vehicle shoulder widths on the bridge and its subsequent determination that separated pedestrian pathways are required on both sides of the bridge, the Commission also analyzed the proposed ST-20 multi-use railing. Several Commissioners expressed the view that the proposed version of this rail was not appropriate for the Ten Mile River bridge due in large measure to its industrial-looking design. It was the sense of the Commission that a more esthetically-pleasing railing would be needed for the proposed bridge in order for the Commission to find the project consistent with the scenic and visual resource policies of the Coastal Act. Given the Commission's condition regarding separated pedestrian pathways within the eight-foot-wide shoulders on both sides of the bridge, a revised railing system will consequently be required and reviewed under coastal development permit applications. Based on Commissioner comments, should the currently proposed version of the ST-20 rail be an element of future coastal development permit applications for the replacement bridge, it is doubtful that this version of the rail could be found consistent with the scenic and visual resource policies of the Coastal Act.

4. <u>Conclusion</u>. The proposed Ten Mile River bridge replacement project is located in a highly scenic coastal area and involves construction on a rural, two-lane section of Highway 1. As a result, the project elements must be

designed, constructed, and operated in a manner that avoids creating significant adverse effects on public views of the Ten Mile River, its immediate environs, and the distant Pacific Ocean. The replacement bridge will be located immediately east of the existing bridge and is designed to mimic its height above the river, its horizontal and vertical geometric curves, and the length of the river crossing. Visual design improvements include haunch girders to soften the more rectangular look of the existing bridge superstructure, and fewer bridge piers within the river and its south bank. The bridge itself will not introduce any new, significant, adverse impacts on visual resources.

The aerial transmission lines that cross the river immediately east of the existing bridge will be removed and placed inside a conduit that will run within the new bridge superstructure, thereby improving the views up the valley of the Ten Mile River. Cut and fill earthwork and vegetation removal is required for the realignment of the Hwy. 1 approaches to the new bridge, including a fill slope to extend the southern approach beyond the existing edge-of-slope. However, the project requires no significant landform alteration or retaining walls to support realigned sections of Hwy.1, and cut and fill slopes will be constructed at 2:1 ratio (horizontal: vertical) to reduce the footprint of ground disturbance and to support the revegetation work that will occur on all disturbed areas. The new fill slope at the south approach will create a temporary visual impact, primarily from the north and from the river upstream of the new bridge, until native vegetation becomes established on this slope. The visual resource impacts from these project elements are adverse in the short-term but are not significant in the long term due to the restoration of disturbed areas that is incorporated into the project.

The proposed project includes eight-foot-wide shoulders on the replacement bridge and shoulder widths off the bridge in the project area that range between eight feet and less than one foot (See Section A.3 for additional details on project shoulders). The potential impacts on visual resources from the widened shoulders and the proposed ST-20 railing design arise from two geographical perspectives: (1) views down to the river from vehicles crossing the bridge could be affected by the wider bridge deck and the ST-20 rail design; and (2) views of the Hwy. 1 corridor in the project area from those traveling on Hwy. 1 could be affected by the wider paved right-of-way and the rail design. While the wider bridge deck will make it more difficult to gaze directly down onto the Ten Mile River, the views that grab ones attention while crossing the Ten Mile River bridge are primarily those in the middle ground and in the distance: the upper Ten Mile River Valley backed by the Coast Range, the lower Ten Mile River and its estuary, the sand dunes of MacKerricher State Park, and the distant Pacific Ocean. Any adverse impact on these visual resources from this perspective due to the wider bridge deck would be insignificant, but views from and towards the bridge would be adversely affected by the proposed

installation of this industrial-looking ST-20 rail design. As discussed previously in this report, the Commission's conditional concurrence calls for Caltrans to revise the project to include pedestrian pathways separated from vehicle traffic lanes and located within the eight-foot-wide shoulders on both sides of the bridge (and as a result, to provide a more esthetically-pleasing railing system for the bridge).

The more challenging question from the Coastal Act perspective is whether the widened shoulders will significantly and adversely affect scenic views of the Hwy.1 corridor itself for those traveling north or south on the roadway, be they in a vehicle, on a bicycle, or on foot. The existing bridge is 26 feet wide; the proposed bridge would be 43 feet wide, a sixty-five percent increase in width. (The wider bridge will provide shoulders for bicyclists, disabled vehicles, and Caltrans maintenance vehicles, and as a condition of the Commission's concurrence, separated pedestrian pathways within the eight-foot-wide shoulders on the bridge.) Existing shoulders off the bridge in the project area range in width between 0.7 and 4.7 feet. The proposed project will increase the upper end of that range to eight feet in order to match the connection with the new bridge. However, as discussed previously in this report (Section A.3), Caltrans agreed to a Commission staff request to significantly reduce the length of eight-foot shoulders off the bridge in all four quadrants, and in the length of the eight- to four-foot transition shoulders on the bridge approaches. This reduction in the extent of proposed paved right-of-way off the bridge reduces the footprint of the project – and the potential visual impact – while still providing the public access improvements of a wider shoulder off the bridge for bicyclists and pedestrians and the safety features noted above.

As discussed previously, the widening of paved shoulders along the Hwy.1 approaches to the proposed Ten Mile River bridge does not require significant landform alteration or massive vegetation removal, and does not involve fill of wetlands or construction in environmentally sensitive habitat. The visual appearance of the new roadway corridor will be different from that which exists today, but because the existing roadway is not physically constrained by the landscape through which it passes (unlike many stretches of rural, coastal Hwy.1 that are squeezed by steep cliffs or rugged topography, more tightly curved in their geometry, or hemmed in by the shoreline or sensitive habitat), any adverse effect of this new corridor would not be significant. The landscape at this location is a widening river valley where Hwy.1 drops down to the bridge from the north and south, and where the scenic coastal views that capture a traveler's attention are focused not on the roadway but away from the road. Hwy.1 at and approaching the crossing of Ten Mile River would remain a scenic two-lane road, albeit wider on the new quarter-mile-long bridge and gradually wider on the approaches to the bridge.

The proposed ST-20 bridge railing is designed to provide safety for vehicles, bicyclists, and pedestrians on the multi-use Hwy.1 crossing of the Ten Mile River. When viewed from the highway, this rail has a 68% window area and 32% solid surface and will not adversely affect views up-valley or west towards the Ten Mile River estuary, the dunes of MacKerricher State Park, or the Pacific Ocean. However, and as noted previously, the industrial-looking design version of this rail as proposed would adversely affect scenic visual resources from and towards the bridge. Lastly, construction and demolition activities that will occur over a three-year time period will affect scenic views in the project corridor. While these latter effects may be adverse at times, they are unavoidable and temporary in nature.

In conclusion, the Commission finds that if modified in accordance with the Commission's conditional concurrence to require submittal of revised plans for the project via coastal development permit applications that provide for pedestrian pathways separated from vehicle traffic lanes and located within the eight-foot-wide shoulders on both sides of the bridge, and with the resulting need for a redesigned and more esthetically-pleasing rail system for the bridge, the Ten Mile River bridge replacement project could be developed in a manner which would minimize permanent and temporary adverse impacts on public views along this section of Highway 1, be compatible with the character of the surrounding area, minimize landform alteration, include adequate measures to mitigate unavoidable impacts, and would be consistent with the scenic and visual resource policies of the CCMP (Coastal Act Sections 30251 and 30254).

H. Cultural Resources

Section 30244 of the Coastal Act provides that:

> **Where development would adversely impact archaeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.**

The* Statutory Exemption Determination Form *prepared by Caltrans for the proposed project addresses in part the potential for cultural resources in the project area:

> **The Area of Potential Effect (APE) for this project has been identified, and includes all construction access routes, temporary construction easements, disposal site, existing and proposed right of way and staging areas for the proposed project. The review of Caltrans cultural resource records indicated that no cultural resources have been previously recorded within the APE. During field surveys by the Caltrans District Archaeologist, no cultural resources were**

observed within the APE, and no known historic properties or historical resources would be affected by the project. Native American consultation also determined no resources of concern within the APE.

An Historic Property Survey Report (HPSR) with findings of No Historic Properties, and Properties Not Eligible For Inclusion In The National Register, has been prepared and signed by the appropriate Caltrans Professionally Qualified Staff, the Environmental Branch Chief, and the Project Manager. The HPSR includes a Historic Resources Evaluation Report and an Archaeological Survey Report supporting the HPSR Findings. The State Historic Preservation Officer has submitted a letter concurring with these findings. The proposed project, therefore, would not involve any significant impacts or adverse effects to any historic, architectural, or archaeological properties.

Further archaeological study may be necessary if the proposed area of work, or work plan, is altered. Additionally, in the event that archaeological materials are encountered during construction activities, Caltrans' policy requires that work be immediately halted in the area of the find until it can be evaluated by a qualified archaeologist.

The proposed Ten Mile River bridge replacement project would occur primarily in a previously developed area along the Highway 1 corridor. The bridge and highway approaches would be realigned to the east approximately 65 feet, a private driveway east of Highway 1 and north of the river would be relocated further to the east, and new pilings would be driven to support the new bridge. All of these activities hold the potential to disturb previously unidentified cultural resources. However, given the cultural resources surveys conducted by Caltrans, Native American consultation, State Historic Preservation Officer concurrence, and Caltrans' commitment to stop work and undertake additional consultation should cultural resources be discovered during construction, the project does not hold the potential to adversely affect cultural resources.

As stated above, a Caltrans staff archeologist has surveyed the project area and determined that there is no evidence in available cultural resource records, or in the field, to suggest that cultural remains are located within the area that would be excavated or otherwise disturbed to construct the proposed project. Nevertheless, it is possible that excavation activities could encounter cultural remains that are not presently anticipated. To ensure that such circumstances would be appropriately handled in a manner protective of cultural resources, the Commission attaches Special Condition 22 (Area of Archaeological Significance, thereby ensuring that if cultural remains are encountered during project operations, the subject ground-disturbing activities shall cease and shall

not recommence until an archaeological plan has been reviewed and approved by the Executive Director.

The Commission finds, therefore, that as conditioned by Special Condition 22, the proposed project would be consistent with policies of Chapter 3 of the Coastal Act protective of cultural resources.

I. Hazards; Geologic Stability

Section 30253 of the Coastal Act provides in pertinent part:

Section 30253 Minimization of adverse impacts

> New development shall:
>
> (1) Minimize risks to life and property in areas of high geologic, flood, and fire hazard.
>
> (2) Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs.

Assumption of Risk

Caltrans states that the proposed bridge location is subject to substantial seismic risks, (including an earthquake of magnitude 8.0 that could be generated by the nearby San Andreas Fault) which may include liquefaction. Further, the location of the bridge renders it subject to the additional hazards posed by storms, floods, and erosion, as is true of any bridge located over a river that drains a substantial watershed and is additionally subject to tidal influence due to the bridge's proximity to the Pacific Ocean.

Caltrans has performed geotechnical testing of the Ten Mile Bridge area and represents that the proposed bridge is designed to withstand the predictable hazards associated with its location to the extent feasible. Nevertheless, the proposed bridge will be subject to natural hazards that can never be fully mitigated and therefore it is not possible to remove all associated risk associated with the uncertainties of natural hazards. Residual risks remain.

For these reasons, the Commission finds that even though Caltrans has mitigated predictable risks by engineering the proposed bridge to withstand the associated forces, a degree of risk from natural or human-induced hazards will remain and cannot be fully mitigated. To protect the Commission and its employees from liability for the hazards posed by the subject structures and project features designed and managed by Caltrans, the Commission requires Special Condition 25 (Assumption of Risk).

Coastal Act Section 30253 also requires that proposed development minimize risks posed by natural hazards, such as flooding. The Ten Mile River estuary is may experience

periodic flooding and scouring that could uncover debris left behind below the present finished elevations of the riverbed and banks (such as the lower levels of pilings, or abutments that scour out years later, as has happened at the Van Duzen River Bridge in Humboldt County during the past two years). The present Ten Mile River conditions are moderately depositional, and scour of the streambed is not occurring generally. However, if these factors change over the anticipated 75 to 100-year anticipated life of the proposed bridge, associated debris left beneath the present surface could be exposed. Caltrans only proposes to cut off the old pilings, for example, a few feet below the riverbed. If piles were exposed in the future, they could present a danger to kayakers or swimmers. Therefore the Commission finds it necessary to impose Special Condition 26 (Future Debris Exposure) to ensure that any debris that is exposed in the future, while presently unexpected, will be removed by Caltrans if necessary.

Finally, Coastal Act Section 30253 requires that new development neither cause nor contribute to erosion or the need to install protective devices that alter natural landforms. Special Condition 8 (Erosion Control and Revegetation Plan) and pertinent parts of Special Conditions 7 (Construction Responsibilities), 9 (Drainage Structures/Maintenance Responsibility), and 12 (Water Quality Protection Plan/SWPPP) require in pertinent part that project activities be conducted in a manner that protects against erosion, and that an erosion control and revegetation plan be finalized to ensure long term performance in accordance with standards typically imposed by the Commission in conditions throughout the coastal zone to ensure long-term erosion control through successful implementation of revegetation requirements.

For all of these reasons, the Commission finds that as conditioned, the proposed project is consistent with the applicable requirements of Section 30253 of the Coastal Act regarding hazards and erosion, and assumption of risk.

I. CEQA

The Commission incorporates its findings on conformity with LCP policies at this point as if set forth in full. These findings address and respond to all public comments regarding potential significant adverse environmental effects of the project that were received prior to preparation of the staff report. As discussed above, the Coastal Development Permit 1-06-022 has been conditioned by the Commission so as to be found consistent with the policies of Chapter 3 of the Coastal Act. As specifically discussed in these above findings which are hereby incorporated by reference, mitigation measures that will minimize or avoid all significant adverse environmental impacts have been made requirements of project approval. As conditioned, there are no feasible alternatives or feasible mitigation measures available, beyond those required, which would substantially lessen any significant adverse impact that the activity may have on the environment. Therefore, the Commission finds that the proposed project can be found to be consistent with the requirements of the Coastal Act to conform to CEQA.

Attachment 1

State of California
DEPARTMENT OF TRANSPORTATION

Business, Transportation and Housing Agency

Memorandum

Flex your power!
Be energy efficient!

To: Robert W. Floerke, Regional Manager
California Department of Fish & Game
P.O. Box 47
Yountville, CA 94599

Date: October 5, 2006

EXHIBIT NO. 8 (Part 1)
APPLICATION NO.
1-06-022 – CALTRANS
CONDITION COMPLIANCE
CALTRANS LETTER OF RESPONSE TO CDFG
(1 of 3)

File: 01-385700
Men-1-PM 69.4/70.1
Ten Mile River
Bridge Replacement

From: LENA R. ASHLEY
Chief, NR Environmental Services – North

Subject: Acknowledgement of Incidental Take Permit for Ten Mile River Bridge Project

Attached is the signed Incidental Take Permit for the Ten Mile River Bridge Replacement Project (permit no 2081-2006-023-03). Both the Project Manager, Alan Escarda, and the North Region Construction Manager, Terry Davis, have signed the acknowledgement section of the permit. Per your request, we have retained a signed original permit for our use. Thank you for your expedited review and issuance of this permit.

Under permit section 4.3.13, the California Department of Transportation (the Department) will select option 4.3.13.2 to mitigate impacts to the covered species during pile driving activities. The Ten Mile project construction scenario was developed to attenuate pile driving hydroacoustic noise to anticipated peak underwater pressure levels no greater than 190 dB with monitoring as described in the hydroacoustic monitoring plan. This construction scenario incorporates all technologically feasible measures to avoid and minimize take potentially resulting from hydroacoustic noise. While the best available science clearly indicates no injury or mortality of the covered species is expected at underwater noise levels of 190 peak dB, we will construct the new bridge with the noise attenuation technology incorporated into the project plans and specifications with the intent to control sound pressures as set forth. We would like to continue discussion with the California Department of Fish and Game (DFG) regarding the arbitrary noise threshold of 190 dB and will pursue modification of what is currently contained in the 2081 permit.

The Department would like to reiterate information provided during consultations that the rationale and calculations shown in the Determination Description and associated table (provided by DFG on 8/31/06) differ from the current best available science in regard to hydroacoustic impacts. In particular, the use of an unsubstantiated theoretical effect

caused by cumulative SEL that can neither be detected nor measured grossly over-estimates the potential area of effect and is not a valid measure of hydroacoustic impact.

These documents also contain assumptions that conclude a higher amount of take of juvenile coho than is expected by the Department and the NOAA Fisheries Biological Opinion, dated June 9, 2006. Accordingly, this higher expectation of take produces a higher potential compensatory mitigation (measured in either monetary compensation or linear length of coho spawning habitat enhancement, as outlined in permit sections 4.3.13.3 and 4.3.13.4, respectively). These permit sections also do not take into account the off-site mitigation work to restore fish passage that has already been proposed at Dunn Creek by the Department. This proposed mitigation work at Dunn Creek already has funding assurance, as provided to DFG on June 26, 2006.

In summary, the Department will construct this urgently needed seismic bridge replacement project consistent with the regulations, and selects the option outlined in permit section 4.3.13.2, despite our previously mentioned objections. The other mitigation options (permit sections 4.3.13.3 – 4.3.13.5) are unsupported by current science, substantially modify the action, are technically infeasible, are excessive based on expected take of listed species, or provide substantial risk of additional impacts to other listed species. We request to continue dialogue to resolve these issues and broaden the range of workable options, and also encourage DFG to participate in research studies of hydroacoustic impacts. Two studies in particular are the NCHRP/TRB/National Research Council "Predicting and Mitigating Hydroacoustic Impacts on Fish from Pile Installations" and the FHWA National Pooled Fund Study for Fish and Bioacoustics.

Thank you for your continuing efforts to help the Department build this important project.

Enclosure(s)

cc: Kevin Hunting, DFG
Alan Escarda, Project Manager
Terry Davis, NR Construction Manager

"Caltrans improves mobility across California"

bc: Jay Norvell, CT HQ
Gregg Erickson, CT HQ
Gina Moran, CT HQ
Deborah McKee, CT HQ
Maxine Ferguson, CT Legal
Matt Brady, CT D1 Deputy Director
Charlie Fielder, CT D1 Director
Steve Croteau, CT Environmental Coordinator
Jo Braden, CT Biologist
Lisa Embree, CT Biologist

"Caltrans improves mobility across California"

California Department of Fish and Game
POST OFFICE BOX 47
7329 SILVERADO TRAIL
YOUNTVILLE CALIFORNIA 94599
California Endangered Species Act
Incidental Take Permit No. 2081-2006-023-03
TEN MILE RIVER BRIDGE PROJECT
CALIFORNIA DEPARTMENT OF TRANSPORTATION

RECEIVED
SEP 29 2006
CALIFORNIA
COASTAL COMMISSION

Authority: This California Endangered Species Act ("CESA") Incidental Take Permit ("Permit") is issued by the Department of Fish and Game ("Department") pursuant to Fish and Game Code sections 2081(b) and 2081(c), and California Code of Regulations, title 14, section 783 et seq. CESA prohibits the take[1] of any species of wildlife designated as an endangered, threatened, or candidate species[2] by the Fish and Game Commission. The Department, however, may authorize the take of such species by permit if the conditions set forth in Fish and Game Code sections 2081(b) and 2081(c) are met. (See also Cal. Code Regs., tit. 14, § 783.4.)

Permittee: California Department of Transportation

Name and title of principal officer: Ms. Lena Ashley
Contact person: Ms. Lisa Embree

Mailing address: 1656 Union Street
Post Office Box 3700
Eureka, CA 95502-3700

EXHIBIT NO. **8 (Part 2)**
APPLICATION NO.
1-06-022 – CALTRANS
CONDITION COMPLIANCE
CDFG 2081 CESA INCIDENTAL TAKE PERMIT
(1 of 25)

Effective Date and Expiration Date of Permit:
This Permit shall be executed in duplicate original form and shall become effective once a duplicate original is acknowledged by signature of the Permittee on the last page of the Permit and returned to the Department's Office of the General Counsel. Unless renewed by the Department, this Permit's authorization to take the Covered Species shall expire on **December 31, 2012.**

---

[1]Pursuant to Fish and Game Code section 86, "'Take' means hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture or kill."

[2]"Candidate species" are species of wildlife that have not yet been placed on the list of endangered species or the list of threatened species, but which are under formal consideration for listing pursuant to Fish and Game Code section 2074.2.

Project Location:
The proposed Ten Mile Bridge Replacement Project ("Project") is located on Route 1 in Mendocino County, between KP 111.7/112.9 (PM 69.4/70.1) approximately 488 meters (1,600 feet) from the Pacific Ocean at the Ten Mile River estuary (Inglenook USGS 7.5 minute quadrangle, T20N, R17W, Section 33).

Project Description:
The project involves the installation of a new bridge over the Ten Mile River and demolition of the existing bridge. The new bridge will have an eight-span superstructure (the bridge deck) supported by three piers (middle supports in the river), four bents (middle supports on land), and two abutments (the end supports). Activities that have the potential to impact listed species include pile driving, cofferdam installation, fish rescue and riparian habitat removal. Construction is proposed to begin in Spring 2007 and continue for a minimum of three construction seasons. Construction delays could extend project activities into 2011.

Covered Species:
This Permit covers the following species:

Name	**Status**[3]
Fish	
CCC coho salmon (*Oncorhynchus kisutch*)	Endangered

This species and only this species is hereinafter referred to as "Covered Species."

Impacts to Covered Species:
The Project will result in impacts to the Covered Species. Individuals of the Covered Species may be incidentally taken as a result of mortality due to barotrauma, mortality due to coffer dam installation, fish rescue operations, and project-caused habitat losses.

Incidental Take Authorization:
The Department authorizes the Permittee, its employees, contractors, and agents to take Covered Species incidentally in carrying out the Project, subject to the limitations described in this section and the conditions of approval identified below. This Permit does not authorize any take of Covered Species from activities outside the scope of the Project as described above; take of Covered Species resulting from violation of this Permit; or intentional take of Covered Species except for capture and relocation of Covered Species and recovery and preservation of carcasses as required by this Permit.

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[3]Refers to status under CESA. Under CESA, a species may be on the list of endangered species, the list of threatened species, or the list of candidate species. All other species are "unlisted."

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Conditions of Approval:
The Department's issuance of this Permit and Permittee's authorization to take the Covered Species are subject to Permittee's compliance with and implementation of the following conditions of approval:

1. Permittee shall comply with all applicable state, federal, and local laws in existence on the effective date of this Permit or adopted thereafter.

2. Permittee shall fully implement and adhere to the conditions of this Permit within the time frames set forth in Attachment 1, the Mitigation Monitoring and Reporting Program ("MMRP"), and shall comply with any measures in the MMRP that are not otherwise set forth in this Permit.

3. Permittee shall implement and adhere to the mitigation measures in the Biological Resources section of the Negative Declaration and Initial Study, adopted by the California Department of Transportation, for the Project on June 21, 2006.

4. Permittee shall fully implement and adhere to the following conditions:

4.1. **General Provisions**:

4.1.1. Before initiating ground-disturbing activities, the Permittee shall designate a representative (Designated Representative) responsible for communications with the Department and for overseeing compliance with this Permit. The Department shall be notified in writing prior to commencement of ground-disturbing activities of the representative's name, business address, and contact information, and shall be notified in writing if a substitute representative is designated.

4.1.2. The Permittee shall hire a biologist knowledgeable and experienced in the biology and natural history of the Covered Species (Designated Biologist). The Designated Biologist shall monitor construction activities within the 100 year floodplain. At least 30 days prior to ground-disturbing activities, the Permittee shall submit to the Department in writing the proposed Designated Biologist's name, qualifications, business address, and contact information for review. The Designated Biologist must be approved by the Department prior to the commencement of ground-disturbing activities.

4.1.3. The Designated Biologist shall have authority to require the Resident Engineer immediately stop any activity that is not in compliance with this Permit, and to order any reasonable measure to avoid the take of an individual of the Covered Species.

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4.1.4. The Permittee shall ensure adequate funding to implement mitigation and monitoring measures prior to any Project construction activities by separate memorandum to the Department and must be approved by the Department prior to initiation of Project construction activities.

4.1.5. Barges shall be placed into the river via the trestle or from the designated launch area approximately 420 m (1,380 ft) east of the existing bridge on the south bank of the river. No other locations are authorized to be used for boat access, launching, landing, barge or boat operations, or personnel access to the tender boat.

4.1.6. Staging of construction materials and equipment shall not occur within the 100 year floodplain of the Ten Mile River. Construction equipment, supplies, materials, spoils and solid wastes shall not be stored on the work trestle. Only cranes, drill rigs, generators, personnel lifts, pumps and new building materials that are actively being used for construction operations may remain on the trestle between work shifts. All other equipment will be moved from the work trestle at the end of each work shift. Each specific piece of equipment or construction material to be used on the work trestle or to remain on the work trestle between shifts shall be identified and provided for in a work trestle specific Water Pollution Control Plan, to be approved in advance by the Department.

4.1.7. All heavy equipment activity within the 100 year floodplain of the Ten Mile River shall only be conducted on temporary trestles and access roads.

4.1.8. No water drafting shall occur in the Ten Mile River or its tributaries.

4.1.9. The Designated Representative shall ensure temporary construction fencing is erected prior to construction to preclude unauthorized activities outside of the designated haul roads within the 100 year floodplain. Temporary construction fencing shall be removed within 30 days of the completion of construction work. All fencing located within the 100 year floodplain shall be removed prior to October 15th of each year and reinstalled after June 15th.

4.1.10. Prior to clearing and grubbing operations, the Designated Biologist shall clearly mark/flag trees within the 100 year flood plain that should be avoided or will be trimmed only as directed by the arborist. Disturbance or removal of vegetation shall not exceed the minimum necessary to complete operations.

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Vegetation outside the construction corridor shall not be removed or damaged without prior consultation and approval of the Department. Where feasible, hand tools (chain saw, etc.) shall be used to trim vegetation to the extent necessary to gain access to the work sites. All cleared material/vegetation shall be removed out of the riparian/stream zone.

4.1.11. The Designated Biologist shall be on-site daily while pile driving, grubbing and grading are taking place to check for compliance with all avoidance and minimization measures, and to check all exclusion zones to ensure that signs, stakes, and fencing are intact and that human activities are restricted to these protective zones. The Designated Biologist shall conduct compliance inspections a minimum of once per month after clearing, grubbing, and grading are completed.

4.1.12. The Permittee shall conduct an education program for all persons who will work on-site during Project implementation and construction. The program shall consist of a presentation from the Designated Biologist that includes a discussion of the biology of the Covered Species, the habitat needs of the Covered Species, its status under CESA, and the management measures provided in this Permit. A fact sheet containing this information shall also be prepared and distributed. Upon completion of the program, employees shall sign a form stating that they attended the program and understand all protection measures. These forms shall be filed at the Ten Mile work site office and shall be made available to the Department upon request.

4.1.13. Project-related personnel shall access the Project site during construction and development activities using existing routes and shall not cross outside of pre approved access roads. To the extent possible, the Permittee shall use previously disturbed areas within the Project site for temporary storage areas, laydown sites, and any other surface-disturbing activities. If construction of offsite routes of travel will be required, the Department shall be contacted prior to carrying out such an activity. The Department may require an amendment to this Permit if additional take of Covered Species may result from Project modification.

4.1.14. The Permittee shall immediately stop/repair and clean up any fuel or hazardous waste leaks or spills on the Project site during construction and development activities at the time of occurrence. The Permittee shall not store any hazardous materials, hydraulic fluids, fuel, or fueling equipment on the work trestle or within the 100 year flood plain of the Ten Mile River. Operations for fueling and servicing cranes and stationary equipment on the work trestle or access roads shall only be performed in accordance with the trestle specific

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Water Pollution Control Plan, to be approved in advance by the Department. The Permittee shall properly dispose of any unused or leftover hazardous products offsite.

4.1.15. The Permittee shall provide Department representatives with reasonable access to the Project site and mitigation lands under its control, and shall otherwise fully cooperate with Department efforts to verify compliance with or effectiveness of mitigation measures set forth in the Permit. Neither the Designated Biologist, nor the Department shall be liable for any costs incurred in complying with the management measures, including cease-work orders issued by the Department or as provided in the Permit.

4.1.16. Upon Project completion, the Permittee shall remove from the site and properly dispose of all construction refuse, including, but not limited to, broken equipment parts, wrapping material, cords, cables, wire, rope, strapping, twine, buckets, metal or plastic containers, and boxes.

4.1.17. Notwithstanding any expiration date on this Permit's take authorization, the Permittee's obligations under this Permit do not end until the Department accepts the Final Mitigation Report as complete.

4.2. **Notification and Reporting**:

4.2.1. The Permittee shall notify the Department and shall document compliance with all pre-construction Conditions of Approval before initiating ground-disturbing activities.

4.2.2. The Designated Representative shall provide the Department with a single weekly status report on all activities authorized by this Agreement. The status report shall list the schedule of events (beginning dates, work in progress, and completion dates). The status report shall be submitted to the Department every Monday until the list of authorized activities is complete or there are scheduled periods of inactivity. The status report shall be sent via email transmittal to cgray@dfg.ca.gov .

4.2.3. The Permittee shall immediately notify the Department in writing if it determines that it is not in compliance with any condition of approval of this Permit, including but not limited to any actual or anticipated failure to implement mitigation measures within the time periods indicated in this Permit and/or the MMRP.

4.2.4. The Designated Representative shall monitor appropriate implementation of

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sound pressure attenuation measures daily and shall provide the Department a written log on a weekly basis.

4.2.5. Beginning with issuance of the Permit and continuing for the life of the Permit, Permittee shall provide the Department an annual Status Report no later than January 31 of every year. Each Status Report shall include, at a minimum: 1) a general description of the status of the Project site and construction activities, including actual or projected completion dates, if known; 2) a copy of the table in the MMRP with notes showing the current implementation status of each mitigation measure; and 3) an assessment of the effectiveness of each completed or partially completed mitigation measure in minimizing and compensating for Project impacts.

4.2.6. All observations of Covered Species and their sign during Project activities shall be conveyed to the Permittee's Designated Representative or Designated Biologist. This information shall be included in the next weekly compliance report submitted to the Department by the Permittee.

4.2.7. No later than 45 days after completion of the Project, including completion of all mitigation measures, Permittee shall provide the Department with a Final Mitigation Report. The Final Mitigation Report shall be prepared by the Designated Biologist and shall include, at a minimum: 1) a copy of the table in the MMRP with notes showing when each of the mitigation measures was implemented; 2) all available information about Project-related incidental take of Covered Species; 3) information about other Project impacts on the Covered Species; 4) construction dates; 5) an assessment of the effectiveness of the Permit's conditions of approval in minimizing and mitigating for Project impacts; 6) recommendations on how mitigation measures might be changed to more effectively minimize and mitigate the impacts of future projects on the Covered Species; and 7) any other pertinent information, including the level of take of the Covered Species associated with the Project.

4.2.8. If a Covered Species is killed by project-related activities during construction, or if a coho salmon is otherwise found dead, the Designated Biologist shall be immediately notified and a written report will be sent to the Department within two (2) calendar days. The report will include the date, time of the finding or incident, location of the carcass, and the circumstances.

4.3. **Other Take Minimization and Mitigation Measures for coho salmon:**

4.3.1. To help mitigate Project impacts on the Covered Species, the Permittee shall implement a fish passage restoration project at Dunn Creek. A fish passage design proposal shall be submitted to the Department for approval prior to December 31, 2006. Permittee shall provide funding assurances for the full amount for implementation of the fish passage project, and shall implement the fish passage project prior to October 31, 2010. This Permit shall be amended if the fish passage project at Dunn Creek is not implemented in the time frame required by this Permit; the Department might require Permittee to provide additional mitigation to fully mitigate temporal losses as part of the amendment.

4.3.2. The Permittee shall implement the Eel Grass Mitigation and Monitoring Plan dated July 12, 2006.

4.3.3. Permittee shall compensate for temporary impacts to 1.964 acres of riparian habitat and permanent impacts to 0.008 acres of riparian habitat by preparing a

mitigation and revegetation plan. This plan must be submitted to the Department at least 60 days prior to start of Project construction activities. The plan must be approved by the Department prior to the commencement of ground-disturbing activities.

4.3.4. Temporary piles within the wetted channel and within 20 feet of the wetted channel shall only be untreated wood or H piles no greater than 24" (2 feet).

4.3.5. All cofferdam sheets shall be installed with a vibratory hammer. Cofferdam installation in the river shall occur during the same work windows as the trestle installation: between June 15 and October 31 of the first year and between September 15 and October 31 of subsequent years.

4.3.6. Pumps used to dewater cofferdams shall be screened as follows:

I. Perforated plate: screen openings shall not exceed 3/32 inches (2.38 mm), measured in diameter.
II. Woven wire: screen openings shall not exceed 3/32 inches (2.38 mm), measured diagonally.
III. Screen material shall provide a minimum of 27% open area.
IV. Approach velocity shall not exceed 0.33 feet per second.

4.3.7. The Permittee shall conduct fish rescue operations during coffer dam dewatering. The Designated Biologist shall continuously monitor the pumping process to ensure that any fish present at the bottom of the structure are relocated back to the river upstream of the work area. One or more of the following NOAA Fisheries-approved methods shall be used to capture gobies, salmonids and other fish species: dip net, seine, throw net, minnow trap, hand, or electrofishing. The Designated Biologist will note the number of each species observed in the affected area, the number of fish relocated, and the date and time of collection and relocation. Data shall be provided to the Department on a weekly basis.

4.3.8. In the event that any individual fish are injured, care will be taken in handling of the specimens to ensure effective treatment and care. Dead specimens will be preserved in the best possible state for later analysis of cause of death. All Covered Species carcasses will be retained, placed in an appropriately sized whirl-pak or zip-lock bag, labeled with the date and time of collection, fork length, location of capture, and frozen as soon as possible

4.3.9. All pile driving for the installation of trestle and falsework in the wetted channel shall occur between June 15 and October 31 during the first year of construction. If additional temporary pile driving is required, work will continue

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between September 15 and October 31 of each subsequent year. Permanent pile driving inside dewatered cofferdams may occur year-round. Pile driving will not occur before dawn or after dusk.

4.3.10. All permanent pile driving activities within the wetted channel shall be contained within dewatered cofferdams to attenuate Sound Pressure Levels (SPLs). All temporary pile driving activities within the wetted channel shall be contained within appropriation isolation casings to attenuate SPLs.

4.3.11. The Permittee shall implement the Hydroacoustic Monitoring Plan dated August 29, 2006 (Attachment 2) with the following modifications: 1) all permanent pile driving between Bent 5 and the wetted channel shall be monitored and 2) all temporary pile driving in the wetted channel and within 25 meters of the wetted channel shall be monitored. A revised Hydroacoustic Monitoring Plan that includes these modifications shall be submitted to the Department prior to December 31, 2006 and must receive written approval prior to construction.

4.3.12. Hydroacoustic data shall be submitted to the Department on a weekly basis. If underwater SPLs for each pile type and size do not vary to a large degree, then the Permittee may request written approval from the Department to discontinue hydroacoustic monitoring. A final report shall be submitted within 30 days of completion. The Permittee shall immediately notify the Department if activities exceed 200 db (Peak) at 10 meters at any time.

4.3.13. In order to mitigate impacts to the Covered Species during pile driving activities, the Permittee shall follow ONE of the following mitigation and/or minimization scenarios. Permittee shall provide the Department written notice of which mitigation scenario will be selected prior to November 1, 2006.

4.3.13.1. The Permittee shall not conduct any land based and/or in-stream pile driving between March 1 and June 15 of each year, OR

4.3.13.2. The Permittee shall not allow pile driving activities which result in peak pressure levels higher than 190 dB at 10m (32 feet) from the source (as proposed by Caltrans). If SPLs exceed 190 dB Peak at any time, all pile driving activities shall cease until operations can be modified to maintain SPLs below 190 dB Peak at all times, OR

4.3.13.3. The Permittee shall provide the Department $2,670,000 for fisheries enhancement projects in the Ten Mile River hydrologic subarea. Fisheries enhancement projects may be instream habitat improvements, invasive

species eradication, native riparian revegetation or fish barrier removal. The total amount of $2,670,000 shall be submitted to the Department prior to construction. The check shall be sent to: Department of Fish and Game, P.O. Box 47, Yountville, CA 94599, Reference Permit No. 2081-2006-023-03. Alternatively, the Permittee can propose a different form of payment or method of funding assurance. The alternative proposal must be sent to the Department prior to December 31, 2006 for review and must be approved prior to construction, OR

4.3.13.4. The Permittee shall enhance approximately 3.33 miles of coho spawning habitat prior to December 31, 2010. A Habitat Restoration Plan shall be submitted to the Department for review prior to December 31, 2006. Project construction shall not begin until the Department provides written approval of a Habitat Restoration Plan. Fish Barrier Removal projects which will open previously obstructed habitat may be weighted at a 2:1 ratio. If habitat enhancement activities are not completed by December 31, 2010, an additional 1.1 miles of habitat enhancement shall be conducted for each additional year beyond 2010, OR

4.3.13.5. The Permittee shall provide a modified Biological Monitoring Plan to the Department prior December 31, 2006. The Biological Monitoring Plan shall include the implementation of a fish cage study to assist in an assessment of take associated with pile driving activities. The Biological Monitoring Plan must clearly specify mitigation to be implemented based on observed results, comparable with the options indicated above, and must be approved by the Department prior to the initiation of Project construction activities.

5. This Permit may be amended without the concurrence of the Permittee if the Department determines that continued implementation of the Project under existing permit conditions would jeopardize the continued existence of a Covered Species. The Department may also amend the Permit at any time without the concurrence of the Permittee as required by law.

6. The Department may issue Permittee a written stop-work order to suspend any activity covered by this Permit for an initial period of up to 25 days to prevent or remedy a violation of Permit conditions (including but not limited to failure to comply with reporting, monitoring, or habitat acquisition obligations) or to prevent the illegal take of an endangered, threatened, or candidate species. Permittee shall comply with the stop-work order immediately upon receipt thereof. The Department may extend a stop-work order under this provision for a period not to exceed 25 additional days, upon written notice to the Permittee. The Department shall commence the formal

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suspension process pursuant to California Code of Regulations, Title 14, section 783.7 within five working days of issuing a stop-work order.

Compliance with Other Laws

This Permit contains the Department's requirements for the Project pursuant to CESA. This permit does not necessarily create an entitlement to proceed with the Project. The Permittee is responsible for complying with all other applicable state, federal, and local laws.

Notices

Written notices, reports and other communications relating to this Permit shall be delivered to the Department by first class mail at the following addresses, or at addresses the Department may subsequently provide the Permittee. Notices, reports, and other communications should reference the Project name, Permittee, and Permit Number (2081-2006-023-06) in a cover letter and on any other associated documents.

Original cover with attachment(s) to:

Regional Manager
Department of Fish and Game
Post Office Box 47
Yountville, CA 94599
FAX (707) 944-5563

Copy of cover without attachment(s) to:

General Counsel
Department of Fish and Game
1416 Ninth Street, 12th Floor
Sacramento, CA 95814

And:

Habitat Conservation Planning Branch
1416 Ninth Street, Suite 1260
Sacramento, CA 95814

Unless the Permittee is notified otherwise, the Department's Regional Representative for purposes of addressing issues that arise during implementation of permit conditions is:

Ms. Corinne Gray
Post Office Box 47
Yountville, California 94599
(707) 944-5526 phone
(707) 944-5595 fax

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Compliance with the California Environmental Quality Act

The Department's issuance of the Permit is subject to the California Environmental Quality Act, Public Resources Code, section 21000 et seq. ("CEQA"). The Department is a responsible agency under CEQA with respect to the Permit because of prior environmental review of the Project by the lead agency, Caltrans. (See generally Pub. Resources Code, §§ 21067, 21069.) The lead agency's prior environmental review of the Project is set forth in the TTM 16549 Negative Declaration (Neg Dec), that Caltrans adopted on June 21, 2006. At the time the lead agency adopted the negative declaration and approved the Project it also adopted all mitigation measures identified in the negative declaration as conditions of project approval.

In fulfilling its obligations as a responsible agency, the Department's obligations under CEQA are more limited than the lead agency. (CEQA Guidelines, § 15096, subd. (g)(1).)[4] The Department, in particular, is responsible for considering only the effects of those activities involved in the Project which it is required by law to carry out or approve and mitigating or avoiding only the direct or indirect environmental effects of those parts of the Project which it decides to carry out, finance, or approve. (Pub. Resources Code, § 21002.1, subd. (d); CEQA Guidelines, § 15096, subds. (f), (g)(1).) Accordingly, because the Department's exercise of discretion is limited to issuance of the Permit, the Department is responsible for considering only the environmental effects that fall within its permitting authority under CESA.

This Permit, along with the Department's CEQA findings for the Permit and Project, which are available as a separate document, document the Department's consideration of the lead agency's negative declaration for the Project and the environmental effects related to issuance of the Permit. (CEQA Guidelines, § 15096, subd. (f).) The Department finds that issuance of the Permit will not result in any previously undisclosed potentially significant effects on the environment or a substantial increase in the severity of any potentially significant environmental effects previously disclosed by the lead agency. Furthermore, to the extent the potential for such effects exists, the Department finds adherence to and implementation of the lead agency's conditions of approval as well as adherence to and implementation of the conditions of approval of the Permit will avoid or reduce to below a level of significance any such potential effects. The Department consequently finds that issuance of the Permit will not result in any significant, adverse impacts on the environment.

CESA Findings

With respect to CESA, the Department finds that, in issuing the Permit, all of the following conditions have been met:

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[4] The "CEQA Guidelines" are found in Title 14 of the California Code of Regulations, commencing with section 15000.

(1) Take of Covered Species as defined in the Permit will be incidental to the otherwise lawful activities covered under the Permit;

(2) Impacts of the taking of the Covered Species will be minimized and fully mitigated through the implementation of measures required by this Permit and as described in MMRP. Measures include: 1) weekly compliance reports; 2) a minimum fish passage improvement project at Dunn Creek; and 3) an education program for all persons working on-site.

(3) The take avoidance and mitigation measures required pursuant to the conditions of this Permit and its attachments are roughly proportional in extent to the impact of Permittee's take.

(4) The measures required by this Permit maintain Permittee's objectives to the greatest extent possible;

(5) All required measures are capable of successful implementation;

(6) The Permit is consistent with any regulations adopted pursuant to Fish and Game Code sections 2112 and 2114;

(7) Permittee has ensured adequate funding to implement the measures required by the Permit as well as for monitoring compliance with, and the effectiveness of, those measures for the Project; and

(8) Issuance of the Permit will not jeopardize the continued existence of the Covered Species based on the best scientific and other information reasonably available, and this finding includes consideration of the species' capability to survive and reproduce, and any adverse impacts of the taking on those abilities in light of (a) known population trends; (b) known threats to the species; and (c) reasonably foreseeable impacts on the species from other related projects and activities. Moreover, the Department's finding is based, in part, on the Department's express authority to amend the terms and conditions of the Permit without concurrence of the Permittee as necessary to avoid jeopardy and as required by law.

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Attachments:

ATTACHMENT 1	Mitigation Monitoring and Reporting Program
ATTACHMENT 2	Hydroacoustic Monitoring Plan

ISSUED BY THE CALIFORNIA DEPARTMENT OF FISH AND GAME

on 9/22/06.

Signature on File

ROBERT W. FLOERKE, Regional Manager
CENTRAL COAST REGION

APPR(

s/ Signature on File

STEPHEN ADAMS
Deputy General Counsel

ACKNOWLEDGMENT

The undersigned: 1) warrants that he or she is acting as a duly authorized representative of the Permittee, 2) acknowledges receipt of this Permit, and 3) agrees on behalf of the Permittee to comply with all terms and conditions of the Permit.

By Alan Signature on File Date: 9/28/2006

Printed Name: Alan ESCARDA / Terry A. Davis Title PM / Const. Manager

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Attachment 1

DEPARTMENT OF FISH AND GAME
MITIGATION MONITORING AND REPORTING PROGRAM (MMRP)

CALIFORNIA INCIDENTAL TAKE PERMIT NO. 2081-2006-023-03
PERMITTEE: California Department of Transportation
PROJECT: Ten Mile River Bridge Replacement

PURPOSE OF THE MMRP

The purpose of the MMRP is to ensure that the impact minimization and mitigation measures required by the Department of Fish and Game ("Department") for the above-referenced project are properly implemented, and thereby to ensure compliance with section 2081(b) of the Fish and Game Code and section 21081.6 of the Public Resources Code. A table summarizing the mitigation measures required by the Department is attached. This table is a tool for use in monitoring and reporting on implementation of mitigation measures, but the descriptions in the table do not supersede the mitigation measures set forth in the California Incidental Take Permit ("Permit") and in attachments to the Permit, and the omission of a permit requirement from the attached table does not relieve the Permittee of the obligation to ensure the requirement is performed.

OBLIGATIONS OF PERMITTEE

Mitigation measures must be implemented within the time periods indicated in the table that appears below. Permittee has the primary responsibility for monitoring compliance with all mitigation measures and for reporting to the Department on the progress in implementing those measures. These monitoring and reporting requirements are set forth in the Permit itself and are summarized at the front of the attached table.

VERIFICATION OF COMPLIANCE, EFFECTIVENESS

The Department may, at its sole discretion, verify compliance with any mitigation measure or independently assess the effectiveness of any mitigation measure.

TABLE OF MITIGATION MEASURES

The following items are identified for each mitigation measure: Mitigation Measure, Source, Implementation Schedule, Responsible Party, and Status/Date/Initials. The "Mitigation Measure" column summarizes the mitigation requirements of the Permit. The "Source" column identifies the Permit document that sets forth the mitigation measure. The "Implementation Schedule" column shows the date or phase when each

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mitigation measure will be implemented. The "Responsible Party" column identifies the person or agency that is primarily responsible for implementing the mitigation measure. The "Status/Date/Initials" column shall be completed by the Permittee during preparation of each Status Report and the Final Mitigation Report, and must identify the implementation status of each mitigation measure, the date that status was determined, and the initials of the person determining the status.

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	Mitigation Measure	Source	Implementation Schedule	Responsible Party	Status / Date / Initials
PRE-PROJECT					
1	Before initiating ground-disturbing activities, Permittee shall designate a representative ("Designated Representative") responsible for communications with the Department and for overseeing compliance with this Permit. The Department shall be notified in writing prior to commencement of ground-disturbing activities of the representative's name, business address, and contact information, and shall be notified in writing if a substitute representative is designated.	Permit	Before commencing ground-disturbing or vegetation-disturbing activities/ Entire project	Permittee	
2	A biologist ("Designated Biologist") knowledgeable and experienced in the biology and natural history of the Covered Species shall monitor grading activities in Covered Species habitat to help avoid the take of individual animals and to minimize habitat disturbance. At least 30 days prior to ground-disturbing activities, Permittee shall submit to the Department in writing the proposed Designated Biologist's name, qualifications, business address, and contact information for review. The Designated Biologist must be approved by the Department prior to the commencement of ground-disturbing activities.	Permit	Before commencing ground-disturbing or vegetation-disturbing activities	Permittee	
3	The Permittee shall implement the Hydroacoustic Monitoring Plan dated August 29, 2006 with the following modifications: 1) all permanent pile driving between Bent 5 and the wetted channel shall be monitored and 2) all temporary pile driving in the wetted channel and within 25 meters of the wetted channel shall be monitored. A revised Hydroacoustic Monitoring Plan with these modifications shall be submitted to the Department prior to December 31, 2006 and must be approved by the Department prior to construction.	Permit	Plan submittal prior to December 31, 2006; plan implementation for duration of related construction	Permittee	
4	The Permittee shall implement a fish passage restoration project at Dunn Creek. A fish passage design proposal shall be submitted to the Department for approval prior to December 31, 2006. Permittee shall provide funding assurances for the full amount for implementation of the fish passage project, and shall implement the fish passage project prior to October 31, 2010. The Department may require an amendment to this Permit if the fish passage project at Dunn Creek is not implemented in the time frame required by this Permit; and may require Permittee to provide additional mitigation to fully mitigate temporal losses	Permit	Prior to December 31, 2006	Permittee	

	Mitigation Measure	Source	Implementation Schedule	Responsible Party	Status / Date / Initials
5	In order to mitigate impacts to sensitive fisheries resources during pile driving activities, the Permittee shall follow one of the following mitigation and/or minimization scenarios. Caltrans shall provide the Department written notice of which mitigation scenario will be selected prior to November 1, 2006. (1) The Permittee shall not conduct any land based and/ or in stream pile driving between March 1 and June 15 of each year. Or, (2) The Permittee shall not allow pile driving activities which result in peak pressure levels higher than 190 dB at 10m (32 feet) from the source. If SPLs exceed 190 dB Peak at any time, all pile driving activities shall cease until operations can be modified to maintain SPLs below 190 dB Peak at all times. Or, (3) The Permittee shall provide the Department $2,670,000 for fisheries enhancement projects in the Ten Mile River HAS. Fisheries enhancement projects may be instream habitat improvements, invasive species eradication, native riparian revegetation or fish barrier removal. The total amount of $2,670,000 shall be submitted to the Department prior to construction. The check shall be sent to: Department of Fish and Game, P.O. Box 47, Yountville, CA 94599, Reference 2081-2006-023-03. Alternatively, Caltrans can propose a different form of payment or method of funding assurance. The alternative proposal must be sent to the Department prior to December 31, 2006 for review and approval. Or, (4) The Permittee shall restore approximately 3.33 miles of coho spawning habitat prior to December 31, 2010. A habitat restoration plan shall be submitted to the Department for review and approval prior to December 31, 2006. If habitat enhancement activities are not completed by December 31, 2010, an additional 1.1 miles of habitat enhancement shall be conducted for each additional year beyond 2010. Or, (5) The Permittee shall provide a modified Biological Monitoring Plan to the Department prior December 31, 2006. The Biological Monitoring Plan shall include the implementation of a fish cage study to determine the level of take associated with pile driving activities. The Biological Monitoring Plan must be approved by the Department prior to the initiation of construction activities.	Permit	Prior to November 1, 2006 (1) Entire Project (2) Entire Project (3) Prior to December 31, 2006 (4) Prior to December 31, 2006 (5) Prior to December 31, 2006	Permittee	
6	The project shall temporarily impact 1.964 acres and permanently impact 0.008 acres of riparian habitat. In order to mitigate impacts associated with the project, a mitigation and revegetation plan shall be prepared and submitted to DFG for approval prior to December 31, 2006.	Permit	Prior to December 31, 2006	Permittee	
7	The Permittee shall ensure adequate funding to implement mitigation and monitoring measures prior to any construction activities by separate memorandum to the Department for Approval.	Permit	Prior to commencing ground-disturbing or vegetation-disturbing activities	Permittee	

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	Mitigation Measure	Source	Implementation Schedule	Responsible Party	Status / Date / Initials
8	The Designated Representative shall ensure temporary construction fencing is erected prior to construction to preclude unauthorized activities outside of the designated haul roads within the 100 year floodplain. Temporary construction fencing shall be removed within 30 days of the completion of construction work. All fencing located within the 100 year floodplain shall be removed prior to October 15th of each year and reinstalled after June 15th.	Permit	Before commencing ground-disturbing or vegetation-disturbing activities Entire Project	Permittee	
9	Prior to clearing and grubbing operations, the Designated Biologist shall clearly mark/flag trees within the 100 year flood plain that should be avoided or will be trimmed only as directed by the arborist. Disturbance or removal of vegetation shall not exceed the minimum necessary to complete operations. Vegetation outside the construction corridor shall not be removed or damage without prior consultation and approval of the Department. Where feasible, hand tools (chain saw, etc.) shall be used to trimmed vegetation to the extent necessary to gain access to the work sites. All cleared material/vegetation shall be removed out of the riparian/stream zone.	Permit	Prior to commencing ground-disturbing or vegetation-disturbing activities	Permittee	
10	The Permittee shall conduct an education program for all persons who will work on-site during Project implementation and construction. The program shall consist of a presentation from the Designated Biologist that includes a discussion of the biology of the Covered Species, the habitat needs of the Covered Species, its status under CESA, and the management measures provided in this Permit. A fact sheet containing this information shall also be prepared and distributed. Upon completion of the program, employees shall sign a form stating that they attended the program and understand all protection measures. These forms shall be filed at the Ten Mile work site office and shall be made available to the Department upon request.	Permit	Prior to commencing ground-disturbing or vegetation-disturbing activities	Permittee	
11	The Permittee shall notify the Department and shall document compliance with all pre-construction Conditions of Approval before initiating ground-disturbing activities.	Permit	Entire project	Permittee	
DURING CONSTRUCTION					
12	The Designated Biologist shall be on-site daily while grubbing and grading are taking place to check for compliance with all mitigation and avoidance measures, and to check all exclusion zones to ensure that signs, stakes, and fencing are intact and that human activities are restricted to these protective zones. The Designated Biologist shall conduct compliance inspections a minimum of once per month after clearing, grubbing, and grading are completed.	Permit	Entire project	Permittee	
13	All permanent pile driving activities within the wetted channel shall be contained within dewatered cofferdams to the mudline to attenuate Sound Pressure Levels (SPLs). All temporary pile driving activities within the wetted channel shall be contained within appropriation isolation casings to attenuate SPLs	Permit	Entire project	Permittee	
14	The Designated Representative shall provide the Department with a single weekly status report on all activities authorized by this Agreement. The status report shall list the schedule of events (beginning dates, work in progress, and completion dates). The status report shall be submitted to the Department every Monday until the list of authorized activities is complete or there are scheduled periods of inactivity. The status report shall be sent via email transmittal to cgray@dfg.ca.gov .	Permit	Entire project	Permittee	

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	Mitigation Measure	Source	Implementation Schedule	Responsible Party	Status / Date / Initials
15	Permittee shall immediately notify the Department in writing if it determines that any of the mitigation measures were not implemented during the period indicated here or in the Permit, or if Permittee anticipates for any reason that measures may not be implemented within the time period indicated.	Permit	Entire project	Permittee	
16	The Designated Biologist shall have authority to immediately stop any activity that is not in compliance with this permit, and to order any reasonable measure to avoid the take of an individual of a Covered Species	Permit	Entire project	Permittee	
17	The Designated Representative shall monitor appropriate implementation of attenuation methods daily and shall provide the Department a written log on a weekly basis.				
18	Hydroacoustic data shall be submitted to the Department on a weekly basis. The Permittee shall immediately notify the Department if activities exceed 200 db (Peak) at 10 meters at any time.	Permit	Prior to commencing ground-disturbing or vegetation-disturbing activities Entire Project	Permittee	
19	Beginning with issuance of the Permit and continuing for the life of the Permit, Permittee shall provide the Department an annual Status Report no later than January 31 of every year. Each Status Report shall include, at a minimum: 1) a general description of the status of the Project site and construction activities, including actual or projected completion dates, if known; 2) a copy of the table in the MMRP with notes showing the current implementation status of each mitigation measure; and 3) an assessment of the effectiveness of each completed or partially completed mitigation measure in minimizing and compensating for Project impacts.	Permit	Entire project	Permittee	
20	All observations of Covered Species and their sign during Project activities shall be conveyed to the Permittee's Designated Representative or Designated Biologist. This information shall be included in the next weekly compliance report submitted to the Department by the Permittee.	Permit	Entire project	Permittee	
21	If a Covered Species is killed by project-related activities during construction, or if a coho salmon is otherwise found dead, the Designated Biologist shall be immediately notified and a written report will be sent to the Department within two (2) calendar days. The report will include the date, time of the finding or incident, location of the carcass, and the circumstances.	Permit	Entire project	Permittee	
22	The Department may issue Permittee a written stop-work order to suspend any activity covered by this permit for an initial period of up to 25 days to prevent or remedy a violation of Permit conditions (including but not limited to failure to comply with reporting, monitoring, or habitat acquisition obligations) or to prevent the illegal take of an endangered, threatened, or candidate species. Permittee shall comply with the stop-work order immediately upon receipt thereof. The Department may extend a stop-work order under this provision for a period not to exceed 25 additional days, upon written notice to the Permittee. The Department shall commence the formal suspension process pursuant to California Code of Regulations, Title 14, §783.7 within five working days of issuing a stop-work order.	Permit	Entire project	Department of Fish and Game	

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POST-CONSTRUCTION					
23	No later than 45 days after completion of the project, including completion of all mitigation measures, Permittee shall provide the Department with a Final Mitigation Report. The Final Mitigation Report shall be prepared by the Designated Biologist and shall include, at a minimum: 1) a copy of this table with notes showing when each of the mitigation measures was implemented; 2) all available information about project-related incidental take of species named in the Permit; 3) information about other project impacts on the species named in the Permit; 4) construction dates; 5) an assessment of the effectiveness of each mitigation measure in minimizing and compensating for project impacts; 6) recommendations on how mitigation measures might be changed to more effectively minimize and mitigate the impacts of future projects on the species; and 7) any other pertinent information. Permittee's monitoring and reporting obligations under this MMRP will end only after the Department accepts the Final Mitigation Report as complete.	Permit	Post-construction and after completion of mitigation	Permittee	
24	The Department accepts the Final Mitigation Report as complete.	Permit	Post-construction	Department of Fish and Game	

Attachment 2

HYDROACOUSTIC MONITORING PLAN FOR THE TEN MILE RIVER BRIDGE REPLACEMENT PROJECT

The purpose of this plan is to document how underwater sound pressures will be measured to assess underwater noise impacts from pile driving activities associated with the construction of the Ten Mile River replacement bridge. There are two types of piles being driven for the project--temporary piles and permanent piles. Underwater sound measurements would be made for the placement of the two types of piles. Underwater noise monitoring would include the measurement of peak sound pressures, root mean square ($RMS_{impulse}$)[1] sound pressure levels and sound energy levels (SEL).

Temporary Piles

At this time, steel shell piles are planned from south of Bent 5 on land and H-Piles are proposed north of Bent 5 on land and in the water for construction of the temporary trestles and false work. For the steel shell piles that will be driven south of Bent 5 on land, no hydroacoustic monitoring is being proposed. For H-piles driven between Bent 5 and Pier 6 in the water and on land, underwater sound levels will be measured for a minimum of one day or three piles for both the land piles and piles in the water. For the H-piles driven between Pier 6 and Pier 7 and between Pier 7 and Pier 8, underwater sound levels will be measured for a minimum of one day or three piles If the underwater peak sound pressure levels are above 200dB (re 1 μPa), additional monitoring may be required. Underwater sound levels will also be measured any time a change in hammer type or size occurs. Measurements would be made at a distance of 10 meters (m) and at other various distances. An attempt will be made to measure closer than 10m when the following conditions are met:

1) The Caltrans Resident Engineer, the construction representative and personnel measuring the underwater sound pressure agree that it does not compromise the workers' safety,
2) It does not put the equipment for measuring the underwater sound pressure in a position that would either delay the contractor or cause damage to the equipment.

The measurement depth will be 3 m for water depths of 4 m or greater. In shallower water, the measurement position will be mid-depth. No measurements will be made in water less than 1 m in depth.

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[1] Measured over the representative duration of the pulse.

Permanent Piles

The permanent piles are 30-inch diameter Cast in Steel Shell piles (CISS) that will be driven in a dewatered cofferdam. There are three planned piers (piers 6, 7 and 8) in the water and one bent (Bent 5) that is near the water on land. For each of these four locations, underwater sound levels will be measured for at least one day and a minimum of three piles. If the underwater peak sound pressure levels are above 200dB (re 1 μPa) additional monitoring may be required. Underwater sound levels will also be measured any time a change in hammer type or size occurs. These measurements will be made at a distance of 10 m and at other various distances, including 100 m both upstream and downstream of the construction activity and at both edges of the Ten Mile River when possible. An attempt will be made to measure closer than 10 m when the following conditions are met:

1) The Caltrans Resident Engineer, the construction representative and personnel measuring the underwater sound pressure agree that it does not compromise the workers' safety,
2) It does not put the equipment for measuring the underwater sound pressure in a position that would either delay the contractor or cause damage to the equipment.

The measurements depth, will be 3 m for water depths of 4 m or greater. In shallower water, the measurement position will be mid-depth. No measurements will be made in water less than 1 m in depth.

Measurement Equipment

Measurements will be made using G.R.A.S. 10CT hydrophones with PCB in-line charge amplifiers (Model 422E13) and PCB Multi-Gain Signal Conditioners (Model 480M122) or equivalent systems. The signals will be fed into Integrating Sound Level Meters (SLM) and Digital Audio Tape Recorders (DAT).

The peak pressure and root-mean square average sound pressure levels ($RMS_{impulse}$ levels) will be measured "live" using the SLM. The SLM will have the ability to measure the unweighted peak sound pressure and RMS sound pressure levels over the relative short periods (e.g., less than 50 milliseconds). Many SLMs can measure the RMS sound pressure level of these pulses using the standard "impulse exponential-time weighting" (35 millisecond rise time) function. Additional subsequent analyses of the acoustical impulses will be performed using a Real Time Analyzer capable of providing narrow band frequency and corresponding pressure over time analysis (waveform).

Quality Control

The measurement systems will be calibrated prior to use in the field. For example, an acoustical pistonphone and hydrophone coupler could be used to send known sound signals to the underwater sound measurement system. This type of pistonphone used with the hydrophone coupler, produces a continuous 145 dB (re 1 μPa) tone at 250Hz. The SLMs are calibrated to this tone prior to use in the field. The tone is then measured by the SLM and is recorded on to the beginning of the digital audiotapes that will be used. The system calibration status would be checked at the end of the measurement event by both measuring the calibration tone and recording the post-measurement on the tape. The taped calibration tones are used to calibrate the real time analyzer prior to analysis of tape-recorded pulses.

All field notes would be recorded in water-resistant field notebooks. Such notebook entries would include calibration notes, measurement positions, pile-driving information, system gain setting, and equipment used to make each measurement.

Data Reporting

A report will be prepared and submitted 30 days following the completion of marine pile driving activities. This report will contain acoustical information (peak, RMS, and SEL) for all piles where measurements were made. Representative frequency spectra and waveform analysis would be provided for each measured pile at a minimum of two different measurement positions. Included with the acoustical information would be the pile identification, distance from the pile, water depth/measurement depth, pile driver size, and other pertinent information. The report would also contain a brief project description, methodology, and presentation of results.

STATE OF CALIFORNIA THE RESOURCES AGENCY
DEPARTMENT OF FISH AND GAME
CENTRAL COAST REGION
(707) 944-5520
Mailing address:
POST OFFICE BOX 47
YOUNTVILLE CALIFORNIA 94599
Street address:
7329 SILVERADO TRAIL
NAPA CALIFORNIA 94558

EXHIBIT NO. 8 (Part 3)
APPLICATION NO.
1-06-022 – CALTRANS
CONDITION COMPLIANCE
CDFG 1602 PERMIT
(1 of 13)

Arnold Schwarzenegger, GOVERNOR

September 15, 2006

Notification Number: 1600-2005-0338-3

Mrs. Lena R. Ashley, Chief
Caltrans, North Region Environmental Services
1656 Union Street
Post Office Box 3700
Eureka, CA 95502-370

1602 LAKE AND STREAMBED ALTERATION AGREEMENT

This agreement is issued by the Department of Fish and Game pursuant to Division 2, Chapter 6 of the California Fish and Game Code:

WHEREAS, the applicant Mrs. Lena R. Ashley, Caltrans, North Region Environmental Services, hereafter called the Operator, submitted a signed NOTIFICATION proposing to substantially divert or obstruct the natural flow of, or substantially change the bed, channel, or bank of, or use material from the streambed or lake of the following water: Dry Creek, tributary to Lake Sonoma, in the County of Mendocino, State of California; and

WHEREAS, the Department has determined that such operations may substantially adversely affect existing fish and wildlife resources including water quality, hydrology, aquatic or terrestrial plant or animal species; and

WHEREAS, the project has undergone the appropriate review under the California Environmental Quality Act; and

WHEREAS, the Operator shall undertake the project as proposed in the signed PROJECT DESCRIPTION and PROJECT CONDITIONS (attached). If the Operator changes the project from that described in the PROJECT DESCRIPTION and does not include the PROJECT CONDITIONS, this agreement is no longer valid; and

WHEREAS, the agreement shall expire on December 31, 2010; with the work to occur between June 15 and October 31; and

WHEREAS, nothing in this agreement authorizes the Operator to trespass on any land or property, nor does it relieve the Operator of the responsibility for compliance with applicable Federal, State, or local laws or ordinances. Placement, or removal, of any material below the level of ordinary high water may come under the jurisdiction of the U. S. Army Corps of Engineers pursuant to Section 404 of the Clean Water Act;

THEREFORE, the Operator may proceed with the project as described in the PROJECT DESCRIPTION and PROJECT CONDITIONS. A copy of this agreement, with attached PROJECT DESCRIPTION and PROJECT CONDITIONS, shall be provided to contractors and subcontractors and shall be in their possession at the work site.

Failure to comply with all conditions of this agreement may result in legal action.

This agreement is approved by:

Signature on File

for Robert W. Floerke
Regional Manager
Central Coast Region

RECEIVED
SEP 29 2006
CALIFORNIA
COASTAL COMMISSION

cc: Lieutenant Kidwell
Warden Combes

STATE OF CALIFORNIA THE RESOURCES AGENCY
DEPARTMENT OF FISH AND GAME
CENTRAL COAST REGION
(707) 944-5520
Mailing address:
POST OFFICE BOX 47
YOUNTVILLE, CALIFORNIA 94599
Street address:
7329 SILVERADO TRAIL
NAPA, CALIFORNIA 94558

Notification Number: 1600-2005-0338-3
Ten Mile River,
Mendocino County

Mrs. Lena R. Ashley, Chief
Caltrans, North Region Environmental Services
1656 Union Street
Post Office Box 3700
Eureka, CA 95502-370
Via Fax: (707) 441-5775

PROJECT DESCRIPTION and PROJECT CONDITIONS

The proposed Ten Mile Bridge Replacement Project is located on Route 1 in Mendocino County, between KP 111.7/112.9 (PM 69.4/70.1). The bridge is located approximately 488 meters (1,600 feet) from the Pacific Ocean at the Ten Mile River estuary (Inglenook USGS 7.5 minute quadrangle, T20N, R17W, Section 33).

The new bridge will be constructed on an alignment approximately 17 meters (56 feet) (centerline to centerline) upstream from the existing bridge. The new bridge will be approximately 451 meters (1,480 feet) long with two 3.6-meter (11.8-foot) lanes, and two 1.8 - meter (6-foot) shoulders. The new bridge will have an eight-span superstructure (the bridge deck) supported by three piers (middle supports in the river), four bents (middle supports on land), and two abutments (the end supports). It is currently proposed to have each of the piers and bents be comprised of two columns, each of which will be supported on approximately 32 0.7 meter (2.5 foot) diameter Cast in Steel Shell (CISS) piles. A private road on the north side of the Ten Mile will be realigned and underground and overhead telephone and electric facilities will be relocated.

Construction for the new bridge is expected to begin in February 2007 with completion anticipated by late 2009. Vegetation shall be cleared and grubbed to establish the temporary access (3 to 9 meters (10 to 30 feet) wide) to the bridge supports.

Access to the two abutments will be from Route 1 and access to the piers and bents will be from the south side of the Ten Mile River. The entrance to the haul road is located off Route 1 approximately 0.8 km (2,625 feet) south of the existing Ten Mile River Bridge. An access road, trestle, or a combination of both east of the new bridge alignment, will provide access to the bent locations between the haul road and the river. The access road will transition into a trestle approximately 20 meters north of the haul road.

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Several legs of the trestle may be extended to the west to provide access and containment for demolition of the old bridge. Alternatively, a separate temporary access road and trestle may be constructed for demolition of the existing bridge. This trestle would be constructed west of the existing bridge and would extend across the river to the toe of the north bank. The trestle would be constructed completely from the south side.

Construction of the access roads will include the use of landing mats and/or fill on geo-fabric placed on the ground. Alternatively, the temporary roads may consist of a temporary plank road made of heavy timbers placed on top of geotextile fabric and securely fastened together.

The trestles will be built 1 meter (3.3 feet) above the ordinary high water elevation. The trestles will be constructed to withstand a 100 year flood event and will pass a 37 year event. The trestle for the new bridge will have several legs extending around the new support locations. The total number of temporary land piles is 382 and the total number of temporary in-stream piles is 323. The trestle will consist of approximately 90 timber piles or steel H-piles and will extend across the river to the toe of the north bank. The trestle will have several legs extending around the new pier locations. The falsework will be supported by approximately 145 timber or steel H-piles. Both temporary structures are designed to withstand high flow events and will remain in the river year round until completion of the project. The building of the trestle and falsework in the river will occur between June 15 and October 31 during the first year of construction. If additional time is necessary to complete these items, the work will continue between September 15 and October 31 during subsequent years of construction. During temporary pile driving, dewatered double walled attenuation casings shall be used to drive temporary H piles in the river. The use of temporary H piles with dewatered isolation casings should result in peak pressure levels no higher than 190 dB at 10 meters.

The contractor may elect to use falsework pads in lieu of driving falsework piles into the ground. Falsework pads, each of which would be approximately 10 meters by 3 meters (33 feet by 10 feet) in size, would consist of concrete or timber members resting on the ground.

The contractor may elect to use barges or small boats for portions or all of the river work if the river is deep enough to accommodate them. They will be placed into the river via the trestle or from a designated launch area. The proposed point for launching and assembly of the barge sections is approximately 420 m (1,380 ft) east of the existing bridge on the south bank of the river (see Figure 2). Access to this location is through the haul road and is wide enough to accommodate heavy equipment. The Ten Mile River bank is approximately 2-3 m (7-10 ft) high at this location. No other locations will be authorized or used for boat access, launching, landing, barge or boat operations, or personnel access to the tender boat.

Cofferdams will be constructed around pier locations, prior to permanent pile driving operations in the river. Cofferdams may also be necessary at bent locations on land, if water intrusion is anticipated. Cofferdams typically consist of 0.6 meter (2-foot) wide sheet piles, driven around the perimeter of the foundation and interlocked together. Cofferdam sheets for this project will be driven with an vibratory hammer. Cofferdams will be dewatered and all trapped fish will be relocated. The pump intake shall be equipped with screens that meet the National Oceanic and Atmospheric Administration (NOAA) Fisheries screening criteria.

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Cofferdam construction shall occur during the same work windows as the trestle and falsework: between June 15 and October 31 of the first year and between September 15 and October 31 of subsequent years.

Each bent and pier foundation will have two 1.8-meter (6-foot) columns supported on approximately 32 0.7 meter (2.5 foot) diameter CISS piles, capped by a reinforced concrete footing.

Material inside the cofferdams will be excavated to approximately 1 meter (3.3 feet) below the bottom of the footing elevation – this would require a minimum depth of excavation of 2.5 meters (8.2 feet) below the existing riverbed. For noise attenuation during pile driving, it is proposed to dewater the cofferdam to below the existing elevation of the riverbed (i.e. below the 'mud line').

Depending on water and pile elevations, continuous pumping of water out of the cofferdam and/or steel shell pilings may be necessary at this stage of construction. The area within the excavated cofferdam may be continually pumped if pump capacity can maintain a dry cofferdam. Water that meets discharge requirements will be pumped back to Ten Mile River. Water requiring further treatment will be pumped to land-based or mobile treatment facilities, prior to discharge.

Driving of the permanent piles inside cofferdams may occur year-round. There will be no pile driving at night.

Continuous pumping of water out of the cofferdams will be required during fish relocation efforts and during permanent pile driving operations and construction. Dewatering construction activities are classified as non-storm water discharges in conformance with Caltrans Statewide National Pollution Discharge Elimination System (NPDES) Permit. As such, all non-storm water discharges will require monitoring, sampling, and analysis.

Once the new bridge is completed and traffic has been rerouted onto it, the old bridge will be demolished. The construction and removal of the temporary falsework and/or temporary platform to catch the bridge pieces as well as the removal of the superstructure itself, will be restricted to August 1-March 31 of any year of construction. The work window minimizes potential effects to swallows and other bird species, such as purple martins, that nest on or in the bridge.

An access road will be constructed on land west of the existing bridge to be used during demolition of the structure. Material used to construct the access road will also be laid out under the bridge to aid in the containment and collection of any concrete debris. The bridge over land will then be dropped in sections onto the containment material and removed.

The portion of the old bridge that is in the river will be accessed by constructing a separate temporary trestle west of the existing structure. The trestle will be made of approximately 64 timber piles or steel H-piles. A platform will be created under the old bridge as a containment system to drop and contain bridge sections. The platform will consist of approximately 34 timber piles or steel H-piles. Cofferdams will be placed around the permanent piles at each support location. The piers will be completely removed or removed to a depth of at least 0.6

meter (2 foot) below final grade.

Disposal Sites

Caltrans is providing optional disposal sites for the contractor. The contractor may choose to keep the material, use the identified site(s) or choose another site to dispose of dirt and other construction related material. Caltrans has identified five optional disposal sites in Mendocino County on Route 1 that have been preliminarily cleared for having a minimal-to-no-likelihood of impacting biological and cultural resources, or encountering hazardous waste/materials. If the contractor chooses to use one or more of the optional disposal sites, pre-disposal botanical surveys (to be conducted in the spring/summer months), a Mendocino County Grading Permit, and a Coastal Development Permit would be required. Revegetation with native species would be required for all sites.

Resources at Risk

The Ten Mile River and its tributaries support habitat for coho salmon (*Oncorhynchus kisutch*), steelhead trout *(O. mykiss)* and tidewater goby. Due to declining populations over most of their range, coho salmon, and steelhead trout of the Ten Mile River basin are listed as "threatened" under the Federal Endangered Species Act (ESA) and Coho salmon are listed as "endangered" under the California Endangered Species Act (CESA).

Conditions:

1. At least 2 working days prior to temporary trestle or permanent pile driving activities within 10 meters of the wetted channel of the Ten Mile River, the operator shall notify Corinne Gray, Environmental Scientist by email at cgray@dfg.ca.gov. Notification shall include the SAA #, contact person and the date pile driving operations will start.

2. All pile driving for the installation of trestle and falsework in the wetted channel shall occur between June 15 and October 31 during the first year of construction. If additional temporary pile driving is required, work will continue between September 15 and October 31 of each subsequent year. Permanent pile driving inside dewatered cofferdams may occur year-round. Pile driving will not occur before dawn or after dusk.

3. All heavy equipment activity within the 100 year floodplain of the Ten Mile River shall only be conducted on temporary trestles and access roads. Temporary pile driving in the waterway, or within 20 meters of the waterway, during the first year will be confined to the period June 15 to October 31.. If the Operator needs more time to complete the authorized activity, the work period may be extended by contacting Corinne Gray at cgray@dfg.ca.gov.

4. This agreement does not allow for any work other than placement of isolation casing, pile driving and other pile installation activities within the flowing channel of the Ten Mile River. All equipment operations must be conducted from the temporary trestle.

5. Any activities not described or modified from the above project description are not covered under this agreement. Any additional grading on the northern bank or outside

of the proposed haul roads is not covered under this agreement. Any modification of the project description of this Streambed Alteration Agreement (SAA) may require an amendment.

6. Permanent and temporary pile driving shall not occur within 25 meters of the wetted channel (~Bent 5) without conducting appropriate monitoring (peak, rms, and SEL). Variations in substrate, water depth and pile driving intensity may increase peak sound pressure levels (SPLs) above lethal levels and monitoring will allow the operator to evaluate pile driving activities. Hydroacoustic data shall be submitted to DFG on a weekly basis. If underwater SPLs for each pile type and size do not vary to a large degree, then Caltrans may request approval from DFG to discontinue hydroacoustic monitoring. A hydroacoustic monitoring plan shall be submitted to DFG for written approval prior to December 31, 2006. A final report shall be submitted within 30 days of completion. Caltrans shall immediately notify DFG if activities exceed 200 db (Peak) at 10 meters at any time.

7. The operator shall monitor appropriate implementation of attenuation methods daily and shall provide DFG a written log on a weekly basis.

8. The Biological Monitoring Plan shall be revised and submitted to DFG prior to December 31, 2006. The Biological Monitoring Plan shall be approved prior to any construction activities.

9. Cofferdam sheets shall only be installed with a vibratory hammer.

10. Cofferdam installation in the river shall occur during the same work windows as the trestle and falsework installation in the river; between June 15 and October 31 of the first year and between September 15 and October 31 of subsequent years.

11. Pumps used to dewater cofferdams shall be screened as follows:
    a. Perforated plate: screen openings shall not exceed 3/32 inches (2.38 mm), measured in diameter.
    b. Woven wire: screen openings shall not exceed 3/32 inches (2.38 mm), measured diagonally.
    c. Screen material shall provide a minimum of 27% open area.
    d. Approach velocity shall not exceed 0.33 feet per second.

12. A fisheries biologist familiar with identification of all life stages of fish will continuously monitor the pumping process to ensure that any fish present at the bottom of the structure are relocated back to the river upstream of the work area. One or more of the following NOAA Fisheries-approved methods shall be used to capture gobies, salmonids and other fish species: dip net, seine, throw net, minnow trap, hand, electrofishing. The fisheries biologist will note the number of each species observed in the affected area, the number of fish relocated, and the date and time of collection and relocation. Data shall be provided to DFG on a weekly basis.

13. Within 30 days of all fish removal activities, a report will be provided to DFG that contains the total number of individuals observed in the affected area, the number of

individuals relocated, and the date and time of the collection and relocation. In the event that any individual fish are injured, care will be taken in handling of the specimens to ensure effective treatment and care. Dead specimens will be preserved in the best possible state for later analysis of cause of death. All covered species mortalities will be retained, placed in an appropriately sized whirl-pak or zip-lock bag, labeled with the date and time of collection, location of capture, and frozen as soon as possible.

14. All temporary piles in the river and land based piles between the river and Bent 5 shall be limited to 24" untreated wood or steel H piles.

15. Barges shall be placed into the river via the trestle or from the designated launch area approximately 420 m (1,380 ft) east of the existing bridge on the south bank of the river. No other locations are authorized to be used for boat access, launching, landing, barge or boat operations, or personnel access to the tender boat.

16. Staging of construction materials and equipment shall not occur within the 100 year floodplain of the Ten Mile River. Staging may occur on trestles, however, material shall be removed prior to any event which may result in inundation.

17. The Contractor shall erect temporary construction fencing to preclude unauthorized activities outside of the designated haul road and near sensitive plant habitat. All areas of wetlands beyond the construction zone will be marked as Environmentally Sensitive Areas (ESA) with flagging or fencing. Fencing location shall be approved by DFG prior to onset of construction activities. Temporary construction fencing shall be removed within 30 days of the completion of construction work. All fencing located within the 100 year floodplain shall be removed prior to October 15th of each year and reinstalled after June 15th.

18. The Operator shall provide DFG with a single weekly status report on all activities authorized by this Agreement. The status report shall list the schedule of events (beginning dates, work in progress, and completion dates). The status report shall be submitted to DFG every Monday until the list of authorized activities is complete or there are scheduled periods of inactivity. The status report shall be sent via email transmittal to cgray@dfg.ca.gov .

19. Water drafting is not covered under this agreement. All water drafting activities associated with the project must be covered under a separate agreement.

20. Material removed for installation of the piles shall not be deposited in the 100 year floodplain unless explicitly authorized by DFG. Material shall be disposed of at an upland site with proper siltation controls and shall not be located where it will likely be washed back into the water or where it will cover aquatic or riparian vegetation.

21. The project shall temporarily impact 1.964 acres and permanently impact 0.008 acres of riparian habitat. In order to mitigate impacts associated with the project, the mitigation and revegetation plan shall be approved by DFG prior to construction.

22. To ensure a successful revegetation effort, all disturbed areas shall be monitored and

maintained (including irrigation as necessary) for five years. All planting shall have a minimum of 80% survival at the end of 5 years and shall attain 70% relative cover after three years and 75% relative coverage after 5 years. If the survival and/or cover requirements are not meeting these goals, the Operator is responsible for replacement planting, additional watering, weeding, invasive exotic eradication, or any other practice, to achieve these requirements. Replacement plants shall be monitored with the same survival and growth requirements for five years after planting. An annual status report on the mitigation shall be provided to DFG by December 31 of each year. This report shall include the survival, percent cover, and height of both tree and shrub species. The number by species of plants replaced, an overview of the revegetation effort, and the method used to assess these parameters shall also be included. Photos from designated photo stations shall be included.

23. Erosion control measures shall be monitored during and after each storm event. Modifications, repairs and improvements to erosion control measures shall be made whenever needed. Upon Department determination that turbidity/siltation levels resulting from project related activities constitute a threat to aquatic life, activities associated with the turbidity/siltation, shall be halted until effective Best Management Practices (BMP's) are installed, or abatement procedures are initiated. DFG may take enforcement action if appropriate turbidity and siltation control measures are not deployed.

24. If clearing in the 100 year floodplain is proposed during the nesting season (February 1 to July 31), nest surveys shall be conducted. A survey report shall be submitted to DFG at least 2 working days prior to the commencement of operations. The following information shall be included: dates of survey activity, total field time of survey efforts, map of survey routes or transects and names of investigators. If active nests are found, the Operator shall consult with DFG and the United States Fish & Wildlife Service (USF&WS) regarding appropriate action to comply with the Migratory Bird Treaty Act of 1918 and the Fish & Game Code of California. If a lapse in project-related work of 15 days or longer occurs, another focused survey and, if required, consultation with DFG and USF&WS, will be necessary before project work can be initiated.

25. Prior to clearing and grubbing operations, a qualified biologist shall clearly mark/flag trees within the 100 year flood plain that should be avoided or will be trimmed only as directed by the arborist. Disturbance or removal of vegetation shall not exceed the minimum necessary to complete operations. Vegetation outside the construction corridor shall not be removed or damage without prior consultation and approval of DFG. Where feasible, hand tools (chain saw, etc.) shall be used to trimmed vegetation to the extent necessary to gain access to the work sites. All cleared material/vegetation shall be removed out of the riparian/stream zone.

26. To the extent that any provisions of this Agreement provide for activities that require the Operator to traverse another owner's property, such provisions are agreed to with the understanding that the Operator possesses the legal right to so traverse. In the absence of such right, any such provision is void.

27. Upon completion of operations and/or onset of wet weather, all <u>disturbed</u> earthen

materials shall be mulched with weed-free straw or native materials.

28. Debris, soil, silt, bark, rubbish, creosote-treated wood, raw cement/concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances which could be hazardous to aquatic life, resulting from project related activities, shall be prevented from contaminating the soil and/or entering the waters of the state. Any of these materials, placed within or where they may enter the River, by Operator or any party working under contract, or with the permission of the Operator, shall be removed immediately.

General Conditions:

29. The US Army Corps of Engineers (COE) has permitting requirements for certain in-stream projects under Section 404 of the Federal Clean Water Act. A COE permit may be required for installation of over one cubic yard of material per linear foot within a stream channel. The applicant shall contact the COE before starting any work activities.

30. The RWQCB has permitting requirements for certain projects under Section 401 of the Federal Clean Water Act. The applicant shall contact the RWQCB before starting any work activities.

31. This agreement does not allow for the take, or incidental take of any State or Federal listed threatened or endangered listed species. The Operator is required, as prescribed in the state or federal endangered species acts, to consult with the appropriate agency prior to commencement of the project. Any unauthorized take of such listed species may result in prosecution.

32. At DFG's request, Operator shall provide DFG with information necessary to establish compliance with this Agreement.

33. Prior to construction, the contractor will be provided with a copy of the DFG permit to read and sign. The signed agreement shall be submitted to DFG prior to operations. The submitted agreement shall include the contractors name, address and contact information.

34. Department personnel or its agents may inspect the work site at any time in the duration of the construction, revegetation, or monitoring phases of this project with notification to the Resident Engineer and agreement to observe project safety guidelines.

35. In the event that the project scope, nature, or environmental impact is altered by the imposition of subsequent permit conditions by any local, state or federal regulatory authority, the Operator shall notify DFG of any imposed project modifications that interfere with compliance to Department conditions.

36. If unforeseen problems arise which are causing significant adverse impacts to fish and/or wildlife resources or as further data is accumulated for analysis, the applicant may be required to remediate the situation to the satisfaction of DFG.

9 of 13

Operator's initials ACE
Notification Number: 1600-2005-0338-3

37. A copy of this agreement must be provided to the contractor and all subcontractors who work within the stream zone and must be in their possession at the work site.

38. The Operator is liable for compliance with the terms of this Agreement, including violations committed by the contractors and/or subcontractors. DFG reserves the right to suspend construction activity described in this Agreement if DFG determines any of the following has occurred:
    a. A). Failure to comply with any of the conditions of this Agreement
    b. B). Information provided in support of the Agreement is determined by DFG to be inaccurate.
    c. C). Information becomes available to DFG that was not known when preparing the original conditions of this Agreement (including, but not limited to, the occurrence of State or federally listed species in the area or risk to resources not previously observed)
    d. D).The project as described in the Agreement has changed or conditions affecting fish and wildlife resources change.

39. Any violation of the terms of this Agreement may result in the project being stopped, a citation being issued, or charges being filed with the District Attorney. Contractors and subcontractors may also be liable for violating the conditions of this agreement.

Amendments

The Operator shall notify DFG before any modifications are made in the project plans submitted to DFG. Project modifications may require an amendment or a new notification.

To modify the project, a written request for an amendment must be submitted to DFG (1600 Program, Post Office Box 47, Yountville, California 94599). Amendments to the original Agreement are issued at the discretion of DFG.

YOUR SIGNATURE BELOW DOES NOT ALONE CONSTITUTE A COMPLETED STREAMBED ALTERATION AGREEMENT.

Please note that you may not proceed with your project until after your proposed project has been reviewed under CEQA and DFG signs the Agreement.

I, the undersigned, state that the above is the final description of the project I am submitting to DFG for CEQA review, leading to an Agreement, and agree to implement the conditions above required by DFG as part of that project. I will not proceed with this project until DFG signs the Agreement. I also understand that the CEQA review may result in the addition of measures to the project to avoid, minimize, or compensate for significant environmental impacts:

Operator's name (print): Alan ESCARDA

Operator's signature: C Signature on File

Signed the 7th **day of** September, 2006

10 of 13

Operator's initials ACE
Notification Number: 1600-2005-0338-3

11413

1600-2005-	For Department Use Only		
Notification Number: 0338-3	Date Received: JUN 13 2005	Date Completed:	
Fee Enclosed? ☒ Yes $ 1,390.50 ☐ No			
Taken/Notes: # 082-605026 STATE OF CALIFORNIA			

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF FISH AND GAME

GRAY
RAMOS
LT. MORSE

NOTIFICATION OF LAKE OR STREAMBED ALTERATION

All fields must be completed unless otherwise indicated.
(See enclosures for instructions.)

Notification Type

☐ Timber Harvesting Plan (No. _____) ☐ Water Application (No. _____)

☐ Commercial Gravel Extraction (No. _____) X☐ Other

Application Information

	Name	Address	Telephone/FAX
Applicant	Alan Escarda Ca Dept. of Transportation	1656 Union Street Eureka, CA 95502-3700 (Attention Lisa Embree)	Business: (916) 274-0659 Fax: (916) 274-0684
Operator	California Department of Transportation	Same as above	Business: (707) 445-6600 Fax:
Contractor (if known)			Business: Fax:
Contact Person (if not applicant)			Business: Fax:
Property Owner			Business: Fax:

Project Location

Location Description:	Mendocino County, Route 1, Post Mile 69.4			
County:		Assessor's Parcel Number:		
Mendocino				
USGS Map	Township	Range	Section	Latitude/Longitude
Inglenook	20 N	17 W	33	
Name of River, Stream, or Lake:	Ten Mile River			
Tributary To?	Pacific Ocean			

12413

NOTIFICATION OF LAKE OR STREAMBED ALTERATION (Continued)

Name of Applicant: Alan Escarda for CA Department of Fish and Game

Project Description							
Project Name:	Ten Mile River Bridge Replacement Project						
Start Date:	2006	Completion Date:	2008	Project Cost:	$ 27 million	Number of Stream Encroachments: (Timber Harvesting Plans Only)	
Describe project below: (Attach separate pages if necessary)							
See attached Project Description X Continued on separate page (s)							

Attachments/Enclosures		
Attach or enclose the required documents listed below and check the corresponding boxes.		
X Project Description	X Map showing project location, including distances and/or directions from nearest city or town	☐ Construction plans and drawings pertaining to the project
Completed CEQA documents:	X Notice of Exemption ☐ Negative Declaration ☐ Mitigated Negative Declaration ☐ Draft or Final Environmental Impact Report ☐ Notice of Determination	
List of applicable local, State, or federal permits, agreements, or other authorizations: All authorizations are pending.	X Local. Describe: County of Mendocino Coastal Permit, County of Mendocino Department of Transportation Encroachment Permit, County of Mendocino Department of Planning & Building Services Floodplain Development Permit (if not included as part of the Coastal Permit), County of Mendocino Department of Planning & Building Services – Grading Permit (for Optional Disposal Site). X State. Describe: CA Depart. of Fish & Game Section 1602, Ca Depart. Of Fish and Game Endangered Species Consultation, CA Regional Water Quality Board Section 401, NPDES/Waste Discharge Requirement, State Coastal Commission Permit, State Lands Commission X Federal. Describe: NOAA Fisheries Endangered Species Consultation, USFWS Endangered Species Consultation	

I hereby certify that all information contained in this notification is true and correct and that I am authorized to sign this document. I understand that in the event this information is found to be untrue or incorrect, I may be subject to civil or criminal prosecution and the Department may consider this notification to be incomplete and/or cancel any Lake or Streambed Alteration Agreement issued pursuant to this notification. I understand that this notification is valid only for the project described herein and that I may be subject to civil or criminal prosecution for undertaking a project that differs from the one described herein, unless I have notified the Department of that project in accordance with Fish and Game Code Section 1602.

I understand that a Department representative may need to inspect the property where the project described herein will take place before issuing a Lake or Streambed Alteration Agreement pursuant to this notification. In the event the Department determines that a site inspection is necessary, I hereby authorize the Department to enter the property where the project described herein will take place to inspect the property at any reasonable time and certify that I am authorized to grant the Department permission to access the property.

☐ I request the Department to first contact me at (insert telephone number) _____ to schedule a date and time to enter the property where the project described herein will take place and understand that this may delay the Department's evaluation of the project described herein.

Signature on File — 6/9/05

Operator — Date

13 of 13

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4213

JUN 9 2006

In response reply to:
151422SWR2004SR8263:GRS

Gene K. Fong
Division Administrator
U.S. Department of Transportation
Federal Highway Administration
California Division
650 Capitol Mall, Suite 4-100
Sacramento, California 95814

RECEIVED
SEP 29 2006
CALIFORNIA
COASTAL COMMISSION

Dear Mr. Fong:

This document transmits the National Marine Fisheries Service's (NMFS) final biological opinion (Enclosure 1) for the Federal Highway Administration's (FHWA) and California Department of Transportation's (Caltrans) proposed replacement of the Ten Mile River Bridge on State Route 1, in Mendocino County, California. FHWA proposes to provide funding to Caltrans to construct a new bridge over the Ten Mile River estuary in Mendocino County, California.

The enclosed biological opinion is based on NMFS' review of information provided with FHWA's request of September 27, 2004, for formal consultation and other documents, meetings, telephone conferences, and analyses completed during consultation. It addresses potential adverse effects on the following listed species (Evolutionarily Significant Unit or Distinct Population Segment), in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. §1531 *et seq.*):

California Coastal Chinook salmon ESU (*Oncorhynchus tshawytscha*)
threatened (June 28, 2005, 70 FR 37160)
critical habitat (September 2, 2005, 70 FR 52488)
Central California Coast coho Salmon (*Oncorhynchus kisutch*)
endangered (June 28, 2005, 70 FR 37160)
critical habitat (May 5, 1999, 64 FR 24049).
Northern California steelhead DPS (*Oncorhynchus mykiss*)
threatened (January 5, 2006, 71 FR 834)
critical habitat (September 2, 2005, 70 FR 52488)

EXHIBIT NO. 9
APPLICATION NO.
1-06-022 – CALTRANS
CONDITION COMPLIANCE
NOAA FISHERIES
BIOLOGICAL OPINION (1 of 60)

The biological opinion also incorporates information and comments provided by FHWA, Caltrans, and Dr. Arthur Popper during review of the May 17, 2006, and June 2, 2006, draft biological opinions. The analyses and findings presented in the final biological opinion are consistent with the May 13, 2006, white paper regarding interim criteria for injury to fish exposed to pile driving operations (Popper *et al.* 2006) (White Paper).

However, as stated in the White Paper, there is a need to account for the accumulation of energy associated with multiple strikes during pile driving, but currently there is no empirical data upon which to base such an analysis. Research is urgently needed to answer this question. As stated in Popper et al. (2006), "Studies are needed that examine cumulative effects of sound exposure on fish. Factors to be considered include cumulative effects of multiple strikes and the effects of different inter-strike intervals on cumulative effects." The development of information regarding the cumulative effects of multiple strikes is vital to future ESA consultations for pile driving in waterways with listed fish species. We are looking to FHWA and Caltrans in coordination with the Fisheries Hydroacoustic Workgroup to develop and complete these studies as soon as possible.

The enclosed biological opinion acknowledges uncertainty regarding the potential for physical injury of listed salmonids exposed to multiple strikes during pile driving, but there is not currently a method by which the level of impact can be quantified. As new information on this subject becomes available, analyses and findings presented in future biological opinions may differ from the results of this consultation. Evidence is emerging and explicit research on this matter will inform subsequent criteria. Therefore, findings and conclusions presented in this biological opinion apply to this action only and should not be viewed as precedent setting for the NMFS Southwest Region or NMFS nationally.

Based on the best available information, the enclosed biological opinion concludes the proposed Ten Mile River Bridge Replacement Project is not likely to jeopardize the continued existence of California Coastal Chinook salmon, Central California Coast coho salmon, or North Coast steelhead, or result in the destruction or adverse modification of designated critical habitat for these species. However, NMFS expects the action is likely to result in take of listed anadromous salmonids. An incidental take statement is included with the enclosed biological opinion. The incidental take statement includes non-discretionary terms and conditions that are expected to further reduce incidental take of listed salmonids as a result of bridge building activities. In addition, several conservation recommendations have been included in the enclosed biological opinion.

This letter also transmits the NMFS' Essential Fish Habitat (EFH) Conservation Recommendations pursuant to section 305(b) of the Magnuson-Stevens Fisheries Conservation and Management Act (MSFCMA) (Enclosure 2). The Ten Mile River Bridge project site is located within an area identified as EFH for various life stages of species managed under the Pacific Coast Salmon Fishery Management Plan, the Coastal Pelagics Fishery Management Plan, and the Pacific Groundfish Fishery Management Plan. Based on our review, NMFS concludes that the Ten Mile River Bridge Replacement Project has the potential to adversely affect EFH. The enclosed Conservation Recommendations are designed to minimize potential adverse effects on EFH.

As required by section 305(b) of the MSFCMA, FHWA must respond in writing within 30 days of receiving these EFH Conservation Recommendations. FHWA must include in their response their acceptability of these recommendations. If FHWA's response is inconsistent with the NMFS' EFH Conservation Recommendations, FHWA must explain its reasons for not following them, including scientific justification for any disagreements with NMFS over the anticipated

effects of the proposed actions and the measures needed to avoid, minimize, or mitigate for such effects. If FHWA adopts the EFH Conservation Recommendations, no further EFH consultation is required for actions covered by this consultation, unless otherwise requested by NMFS.

If you have any questions regarding the enclosed biological opinion or EFH Conservation Recommendations, please contact Gary Stern of my staff at (707) 575-6060.

Sincerely,

Signature on File

for Rodney R. McInnis
Regional Administrator

cc: Russ Strach, NMFS, Sacramento, California
Jay Norvell, Caltrans, Sacramento, California
Bryant Chesney, NMFS, Long Beach, California
John Stadler, NMFS, Lacey, WA
Lena Ashley, Caltrans, Eureka, California
Emily Teachout, USFWS, Lacey, WA
Ray Bosch, USFWS, Eureka, California
Corinne Gray, CDFG, Yountville, California
Vicki Frey, CDFG, Eureka, California
Thomas Bigford, NMFS, Silver Spring, Maryland
Angela Somma, NMFS, Silver Spring, Maryland
Brandon Southall, NMFS, Silver Spring, Maryland

3460

Enclosure 1

BIOLOGICAL OPINION

ACTION AGENCY:	U.S. Department of Transportation, Federal Highway Administration, California Division
ACTION:	Funding for the Ten Mile Bridge Replacement Project
CONSULTATION CONDUCTED BY:	National Marine Fisheries Service, Southwest Region
FILE NUMBER:	151422SWR2004SR8263
DATE ISSUED:	June 9, 2006

I. CONSULTATION HISTORY

On September 15, 2003, the California Department of Transportation (Caltrans) met with the National Marine Fisheries Service (NMFS) in Santa Rosa, California to discuss the Ten Mile River Bridge Replacement Project. The purpose of the meeting was to get preliminary feedback regarding potential project effects on listed anadromous salmonids including the impacts of pile driving in the Ten Mile River estuary.

On March 10, 2004, NMFS received a copy of a draft biological assessment (BA) prepared by Caltrans and transmitted to the Federal Highway Administration (FHWA). This BA, entitled *Biological Assessment, Replacement of Bridge Crossing the Ten Mile River*, directed FHWA to transmit the BA to NMFS, if FHWA concurred with Caltrans' BA findings.

A meeting with held with Caltrans, NMFS, and U.S. Fish and Wildlife Service (USFWS) on April 27, 2004, in Ukiah, California to discuss in detail the potential effects of driving large diameter piles in the presence of adult and juvenile salmon and steelhead. Caltrans proposed the use of 2.13 meter (m) diameter piles for the new bridge. Caltrans indicated that their construction schedule would allow for the driving of temporary piles to occur outside of the primary migration periods of anadromous salmonids. Caltrans, NMFS, and USFWS agreed that temporary piles would be installed between June 15 and October 31 of the first year, and between September 15 and October 31 of subsequent years. Due to Caltrans' construction schedule, the project's permanent piles may be installed at any time of year. The permanent piles would be installed within cofferdams.

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In May 2004, Caltrans transmitted additional draft copies of the March 2004 BA for the proposed project.

Based on phone conversations and electronic messages between Caltrans and NMFS on June 16, 2004, Caltrans revised the Ten Mile River Bridge Replacement Project BA. The revised BA, dated July 20, 2004, was submitted by FHWA to NMFS on August 2, 2004 .

On September 27, 2004, NMFS received a written request to initiate formal section 7 consultation from FHWA. Attached to this request, FHWA submitted a revised draft BA dated September 2004.

NMFS staff reviewed the September 27, 2004 consultation initiation package from FHWA and determined that additional information was necessary to initiate formal section 7 consultation. By letter dated October 22, 2004, NMFS requested FHWA provide additional information regarding the number of permanent piles, time required to drive the piles, maximum peak sound levels anticipated, and other potential effects of the proposed project.

On January 20, 2005, Caltrans, NMFS, the California Department of Fish and Game (CDFG), and the U.S. Army Corps of Engineers (Corps) held a field meeting at the project site. The agencies discussed the proposed construction methods and possible measures for minimizing impacts to aquatic resources.

By letter dated February 4, 2005, to FHWA, Caltrans provided additional information requested by NMFS. On March 1, 2005, Caltrans met with NMFS in Ukiah to discuss the project and the adequacy of the additional information provided by Caltrans. FHWA submitted Caltrans' February 4, 2005, letter to NMFS as supplemental information to the BA. NMFS received the FHWA supplement BA information on March 22, 2005.

By letter dated May 12, 2005, to NMFS, Caltrans further clarified the schedule for pile driving, proposed noise monitoring, and potential mitigation projects related to compliance with provisions of the California Endangered Species Act (CESA). Caltrans sent an addendum, dated June 1, 2005, to NMFS that described changes to the schedule for pile driving, noise monitoring, and modifications to the proposed pile driving inside cofferdams.

By letter dated August 4, 2005, NMFS requested FHWA initiate consultation to address potential adverse effects to Essential Fish Habitat (EFH) pursuant to the Magnuson Stevens Fishery Conservation and Management Act (MSFCMA).

A meeting was held on August 24, 2005, with Caltrans, their sound consultants (Illingworth and Rodkin), NMFS, CDFG, and USFWS attending. Caltrans provided agency representatives with copies of an updated Appendix B (Comparison of Sound Exposure Level-Based Recommendations for Guidance with Available Data) from the "Effects of Sound on Fish" document (Hastings and Popper 2005). Potential underwater

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sound pressure levels resulting from the proposed project were discussed along with specific measures to minimize impacts of the project on listed species.

On September 13, 2005, FHWA transmitted an EFH assessment and Ten Mile River Bridge Eelgrass Mitigation and Monitoring Plan to be included as part of the proposed project. The EFH assessment was in response to NMFS' August 4, 2005, letter requesting FHWA to initiate EFH consultation concurrent with the ESA consultation.

Caltrans, NMFS, USFWS, and CDFG, held a phone conference on November 10, 2005. The call was to resolve issues such as potential CESA mitigation sites, the eelgrass mitigation and monitoring plan, and the marine mammal monitoring plan. The majority of the conference call focused on the request by NMFS and CDFG to conduct sonar monitoring to help determine the extent of adverse biological effects that are likely to occur during pile driving.

Caltrans, FHWA, NMFS, USFWS, and CDFG held additional telephone conference calls on January 10, 2006, and February 3, 2006 to discuss the request for sonar monitoring. NMFS continued to stress the need and obligation of FHWA to monitor the incidental take of listed salmonids during pile driving.

FHWA responded to NMFS request for sonar monitoring in a letter dated March 1, 2006. The letter requested that NMFS provide a biological opinion for the Ten Mile River Bridge Replacement Project within 30 days, and stated that FHWA believes the sonar monitoring requested by NMFS constitutes research, not monitoring.

The final *Eelgrass Mitigation and Monitoring Plan for the Ten Mile River Bridge Replacement Project*, dated March 17, 2006, was transmitted by Caltrans via electronic mail to NMFS on March 21, 2006.

On April 12, 2006, Caltrans transmitted via electronic mail to NMFS an addendum to the BA. The addendum included further modifications to the project description, including changes in the superstructure design, additional disposal sites, and other modifications to the project description. Caltrans also requested a draft biological opinion by May 5, 2006.

Various meetings, telephone conferences, and site visits between Caltrans, FHWA, NMFS, CDFG, and USFWS since early 2004 resulted in substantial changes to the proposed project in order to minimize and avoid adverse effects to listed salmonids and other aquatic species. These modifications included reducing pile size, using H-piles for temporary piles, the use of isolation casings for the installation of temporary piles, and the use of a vibratory hammer to install the sheet piles used to construct the coffer dams. With the information provided by Caltrans and FHWA on April 12, 2006, NMFS received a complete project description and mitigation plans for the Ten Mile River Bridge Replacement Project. Based on this final project description, NMFS had adequate information on April 12, 2006 to initiate formal consultation and prepare a biological opinion.

NMFS transmitted a letter to the FHWA on April 18, 2006, regarding the need to conduct the sonar monitoring to determine the level of incidental take during the pile driving phases of the proposed project. A subsequent meeting was convened on April 27, 2006, between the FHWA, Caltrans, and NMFS, at which the FHWA and Caltrans agreed to conduct sonar monitoring as a Conservation Recommendation, which would be specified in the NMFS biological opinion.

At Caltrans' request, NMFS provided the terms and conditions of the incidental take statement from the draft biological opinion to Caltrans on May 15, 2006. To discuss the draft terms and conditions, a meeting was convened in Sacramento on May 17, 2006 with representatives of Caltrans, FHWA, and NMFS. The meeting focused on measurable monitoring techniques during project implementation and the metric used for predicting the adverse effects of high underwater sound levels during pile driving on listed salmonids. Specifically, discussion focused on the need to consider the cumulative impacts of multiple hammer strikes during pile driving. The May 17, 2006, draft of the biological opinion was provided to FHWA and Caltrans during this meeting.

On May 24, 2006, Caltrans provided NMFS with comments on the draft biological opinion. A meeting was held on May 25, 2006, in Sacramento, California with NMFS, FHWA, and Caltrans staff in attendance or participating by phone to discuss the biological opinion's effects analysis. Discussion focused on the need to consider the cumulative impacts of multiple hammer strikes during pile driving and its relationship to the single strike criterion presented in the May 13, 2006 white paper (Popper *et al.* 2006). Dr. Arthur Popper from the University of Maryland participated by telephone. Scientists from the NMFS Northwest Fisheries Science Center also participated in this meeting by telephone. During the two-hour meeting, NMFS and Dr. Popper agreed that energy from multiple pile driving strikes needs to be considered in determining effects to listed salmonids; however, at this time, there is no empirical data available to calculate an accumulated sound exposure criterion for fish. Dr. Popper suggested the single strike 187 decibel Sound Exposure Level (SEL) criterion used in the May 13, 2006 white paper (Popper *et al.* 2006) is very conservative and should be protective for exposure of listed fish to multiple hammer strikes at the Ten Mile River Bridge Replacement Project. NMFS agreed to revise the draft biological opinion based on this new information and provide an updated draft to FHWA and Caltrans on June 1, 2006.

On June 2, 2006, a revised draft biological opinion was transmitted to FHWA and Caltrans for their review and comment. Caltrans staff provided comments to NMFS by telephone on June 6, 2006 and electronic mail on June 7, 2006. Caltrans requested clarification on terms and conditions in the Incidental Take Statement related to sound monitoring during pile driving. Based on Caltrans' comments, the notification and response procedures in two terms and conditions of the Incidental Take Statement were revised in the final biological opinion.

II. DESCRIPTION OF THE PROPOSED ACTION

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A. General Description of Proposed Project

FHWA proposes to provide funding to Caltrans to construct a new bridge over the Ten Mile River in Mendocino County, California. The new bridge will be adjacent and upstream of the old bridge. The old bridge will be demolished once traffic has been rerouted to the new bridge. Construction is anticipated to occur year-round for three years beginning in 2007 and terminating in 2009.

The new bridge will be built on an alignment approximately 16 meters (centerline to centerline) upstream from the existing bridge. The new bridge will be approximately 451 meters long with two 3.6-meter lanes, two 2.4-meter shoulders and two 0.525-meter wide Type 80 Concrete Barrier Railings. New metal beam guard rails will be constructed, and temporary and permanent erosion control measures will be applied to the new cut and fill slopes. In addition to replacing the bridge, other work involves realigning a private road that serves a residence. This private road currently parallels Route 1 on the east side, north of the bridge. Also, underground and overhead telephone and electric facilities will be relocated.

The new bridge will have an eight-span superstructure (the bridge deck) supported by three piers (middle supports in the river), four bents (middle supports on land), and two abutments (the end supports). Each of the piers and bents will be comprised of two columns, each of which will be supported on several 0.76 meter diameter Cast-in-Steel-Shell (CISS) piles.

1. Construction Timing

Construction of the new bridge is expected to begin in February 2007, with completion of the entire project anticipated by December 2009. Caltrans expects to have the work within the river completed within two summers of the onset of construction, but has requested consideration of the potential environmental effects if work in the river occurs for three years. Delay due to weather or equipment failure may occur and could result in a third season of work in the river.

2. Project Area

Project construction will occur in and over the estuary of the Ten Mile River, Mendocino County, California. The new bridge will be located on Route 1 between Kilometer Post 111.7 and 112.9, sixteen kilometers north of the city of Fort Bragg, California, and approximately 488 meters from the Pacific Ocean. Most of the land component of the project area extends from just north of Camp 2 Ten Mile Road to the southern end of the staging area, which is approximately 0.8 kilometers (0.5 miles) south of the bridge. The project area also encompasses the proposed disposal site, which is 5.6 kilometers (3.5 miles) north of the bridge.

B. Construction of New Bridge on Land

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The contractor will be constructing temporary roads (3 to 9 meters wide) to provide access to the new bridge supports. Access to the two abutments will be from Route 1. Access to the piers and bents will be from the south side of the Ten Mile River. Construction of the access roads will include the use of landing mats and/or fill on geo fabric placed on the ground.

The construction zone width will be approximately 14.5 meters beyond the westerly edge of deck of the existing bridge to 25 meters beyond the easterly edge of deck of the new bridge. Existing vegetation will be preserved as much as possible within the zone. All areas of wetlands beyond the construction zone at the project site will be marked as Environmentally Sensitive Areas with flagging or fencing. Staging of construction materials and equipment will occur within the construction zone and also at an existing turnout along the west side of Route 1, 0.8 km south of the bridge. If needed, the contractor may elect to rent additional land for a construction yard. If so, the contractor would be responsible for obtaining any necessary permits.

Falsework will be constructed on land (as well as in the river) to serve as temporary support for the bridge superstructure and prevent material from falling on the ground or into the river. The foundation for the falsework on land will consist of piles, of any type, which support a system of posts, beams, joists, and plywood forms.

The end supports of the new bridge will be concrete seat-type abutments with foundations consisting of piles that are driven and/or drilled into the ground. If drilled, the holes will be filled with reinforcing steel and concrete. A reinforced concrete footing will likely be constructed to cap the pilings. Then, concrete abutment seats are installed to support the bridge superstructure.

A small excavation will be cut into the existing ground at the top of the north bank for the north abutment. Fill of imported material will be placed at the top of the south bank, extending down to the existing access road. Although this fill will not impact wetlands, an Environmentally Sensitive Area fence will be placed along the boundary of the wetland. A small area of this fill will be excavated to provide room for the south abutment.

C. Construction of New Bridge in the River

1. Construction of the Trestle and Falsework for the New Bridge

Initial construction work will include construction of a temporary trestle and falsework. The temporary trestle will consist of approximately 90 steel or timber 24-inch diameter H-piles. This trestle will extend across the river to the toe of the north bank and will have several legs extending around the new pier locations. The falsework will be supported by approximately 145 steel or timber 24-inch diameter H-piles.

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The project proposes to use a dewatered isolation casing, or a similar system, to drive temporary H-piles in the river. Dewatered isolation casings create an air space between the temporary H-pile and the surrounding river. This system was utilized on the Humboldt Bay Bridges Seismic Retrofit Project and was found to provide about 9 decibels (dB) of attenuation. The driving of temporary H-piles through a dewatered isolation casing should result in peak pressure levels no higher than 190 dB re one micropascal[1] 10 meters from the pile being installed.

Use of a trestle and the falsework will allow the contractor to work in the river without diverting the flow. Both temporary structures are designed to withstand high flow events and will remain in the river year round until completion of the project. The contractor will be responsible for removing any debris that may become entangled in them. Debris that come from natural sources (*i.e.* logs and large branches) will be moved to a point below the bridge where the material can move downstream and to the beach. The building of the trestle and falsework will occur during the first year of construction, between June 15 and October 31. If additional time is required to complete these items, the work will continue between September 15 and October 31 during subsequent years of construction.

The contractor may elect to use barges or small boats for portions or all of the river work. If the contractor uses barges and the river is deep enough to accommodate them, they will be low draft platform barges (flexifloats) with spud or jack anchors. They will be placed into the river via the trestle or from a designated launch area

2. <u>Construction of the Piers and Bridge Superstructure</u>

Each bent and pier foundation will have two 1.8 meter columns supported on a group of approximately 0.76 meter diameter CISS piles, capped by a reinforced concrete footing. Cofferdams will be constructed around pier locations, prior to permanent pile driving operations in the river. Cofferdams may also be necessary at bent locations on land, if water intrusion is anticipated. Cofferdams typically consist of 0.6 meter wide sheet piles, driven around the perimeter of the foundation and interlocked together. After the sheet piles are connected, the resulting cofferdams will be dewatered with a pump to provide a dry work area for the construction of the footing. Fish will be relocated before or during dewatering, and the pump will be screened to eliminate potential impacts to fish.

All discharges to surface waters will be regulated under a site-specific National Pollutant Discharge Elimination System/Waste Discharge Requirement (NPDES/WDR) permit to be issued by the North Coast Regional Water Quality Control Board (RWQCB). The North Coast Basin Plan requires avoidance of turbidity increase greater than 20 percent of background turbidity levels. Water requiring further treatment will be pumped to land-based or mobile treatment facilities prior to being allowed to enter the river.

Upon completion of cofferdam construction for piers six, seven, and eight, steel piles will be driven into the ground, until they reach competent material. The steel piles may be

[1] In the remainder of this document, peak pressure levels are referenced to one micropascal.

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vibrated in a portion of the pile length. An impact hammer will then be used to drive the piles to their final depth. The insides of the steel piles will be cleaned out by drilling. The excavated material will be transported to an approved disposal site by trucks. After drilling, the piles will be fitted with rebar and filled with concrete, and capped with a reinforced concrete footing. During this time, the area within the excavated cofferdam may be continually pumped if pump capacity can maintain a dry cofferdam. Alternatively, a seal course may be poured in the cofferdam to form a water barrier. If a seal course is constructed, a short settling period is required before water in the cofferdams can be pumped out to provide a dry working area.
Once the trestle has been extended to the pier locations and an attenuation system (discussed below) for the piles has been completed, driving of the permanent piles may occur year-round. There will be no pile driving at night. Several floating platforms that could be hoisted by a crane into and out of the water outside of the cofferdams and on to the trestle on a daily basis may be used to help facilitate pile driving operations.

After the foundations are completed, the columns will be constructed. First, steel cages to reinforce the columns will be placed into and above the foundations. Forms are then placed around the steel cages, and concrete is cast inside the forms and cured. Concrete will be delivered by trucks with hose lines. Each column will be 1.8 meters in diameter.

After the falsework and forms are constructed, reinforcing steel and concrete will be placed to complete the bridge superstructure. After the concrete has been poured and reached its required strength, the bridge will be post tensioned by tightening high strength steel tendons that are installed in the bridge. Concrete will be delivered from trucks feeding pumps with hose lines.

3. Use of Attenuation Systems

The sheet metal piles used to construct cofferdams in the river will be driven with a vibratory hammer. Dewatered cofferdams will allow for the construction of the footings, and Caltrans expects the coffer dams will serve to attenuate the effects of underwater sound pressure on fish during the installation of the permanent piles. Use of dewatered cofferdams will be required in the contract.

4. Fish Relocation

As described above, the water within the cofferdams will be pumped out to dewater the workspace. If salmonids are trapped in the cofferdam, pumping the water out could cause mortality to those fish. To minimize this risk, the pump intake will be double-screened to prevent fish from being entrained in the pump. A fisheries biologist familiar with identification of all life stages of salmonids will continuously monitor the pumping process to ensure that any fish present at the bottom of the structure are relocated back to the river upstream of the work area. One or more of the following NMFS-approved methods shall be used to capture salmonids and other fish species: dip net, seine, hand, electrofishing. The fisheries biologist will note the number of each species observed in

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the affected area, the number of fish relocated, and the date and time of collection and relocation.

Within three months of any fish relocation activities, a report will be provided to NMFS that indicates the number of individuals observed in the affected area, the number of individuals relocated, and the date and time of the collection and relocation. In the event that any listed salmonids are injured, care will be taken in their handling to ensure further injuries do not occur. Dead specimens will be preserved for later analysis of cause of death. All dead listed salmonids will be retained, placed in an appropriately sized whirl pak or zip lock bag, labeled with the date and time of collection, fork length, collection location, and frozen as soon as possible. Any salmonids killed and collected by this project will be transferred to the NMFS Southwest Fisheries Science Center's Santa Cruz Laboratory Tissue Repository within thirty days of collection.

5. Removal of the Trestle, Falsework and Cofferdams

When it is determined that the trestle, falsework, and cofferdam systems are no longer needed, they will be dismantled and the piles will be completely removed. The removal of piles may occur at any time during the year. The contractor will retreat along the trestle to remove the piles, which will be vibrated out.

6. Night Work

Minor construction activities, such as maintenance of equipment and delivery of materials for subsequent days work, may occur at night. If lighting is required on the trestle, the lights will be shielded to avoid illumination of the river.

D. Demolition of Existing Bridge

Once the new bridge is completed and traffic is routed onto it, the old bridge will be demolished. Caltrans anticipates this will occur in the late summer of 2009. Over land, the bridge will then be dropped in sections onto filter fabric or similar material and removed. Over the open water, the contractor will access the old bridge by either extending several legs of the primary trestle to the west; or, a separate access road and temporary trestle will be constructed in the water just west of the existing bridge. The trestle will be made of 70 timber piles or steel H-piles. There will also be a containment system that will serve as a platform onto which the bridge sections will be dropped. The platform under the existing bridge will consist of 66 timber piles or steel H-piles. Coffer dams, casings, or similar containment measures will be placed around each permanent pile. The piers will be removed if possible, otherwise the piers will be cut down to a depth of at least 0.6 meter below the existing channel bottom.

If the contractor elects to construct the trestle and falsework for the demolition of the existing bridge during the first summer of the project, this work will occur between June 15 and October 31. If installation of the trestle, falsework, or both is not completed during this time period, work on these components will continue during subsequent years,

between September 15 and October 31. When Caltrans or their contractor determines that the trestle, falsework, and containment systems are no longer needed, they will be dismantled and the piles will be completely removed. The removal of piles from all three project components may occur year-round.

A staging area for the project will be located directly adjacent to Route 1, approximately 0.5 mile (0.8 kilometer) south of the bridge and across from the entrance to the old Georgia-Pacific haul road. The proposed staging area is a dirt pullout and is devoid of vegetation.

E. Additional Measures to Avoid and Minimize Impacts

1. Best Management Practices (BMP)

Caltrans has established several best management practices (BMP) for maintaining water quality during construction. Caltrans will ensure that the contactor utilizes the following BMPs:

1) Erosion of exposed soils will be minimized to avoid degradation of water quality;

2) Wetlands and sensitive areas will be marked with Environmental Sensitive Area fences. Staging areas, storage areas, and equipment parking will not occur within these areas or adjacent to the creek;

3) All discharges to surface waters will be regulated under a site-specific National Pollutant Discharge Elimination System/Waste Discharge Requirement (NPDES/EDR) permit. Caltrans will be required to sample and test the point of discharge;

4) Water pumped out of the cofferdams will only be delivered to the estuary if it meets the following conditions:

- Prior to possible contamination by cements, such as placing the seal course, the physical composition of the water will be the same as the water in the estuary and no treatment or testing will be required.

- After possible contamination by cements, such as placing the seal course, the physical composition of the water will be monitored. Water requiring further treatment will be pumped to land-based or mobile treatment facilities prior to being allowed to enter the estuary.

5) Caltrans will be required through the NPDES/EDR permit to ensure sampling and testing both upstream and downstream during any activity which will (by direct observation) increase turbidity. The North Coast Basin Plan requires that turbidity not be increased by more than 20 percent of background;

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6) After the cofferdam sheets are installed and cofferdams dewatered, sediment inside the area will be excavated down to an elevation below the top of the permanent pilings. Trucks will be used to haul the excavated material to an approved disposal site, and;

7) No concrete washings or water from concrete will be allowed to enter into the estuary. No concrete will be poured within flowing water or water of the estuary. All cured concrete will be washed prior to having the cofferdams removed and wash water will be removed. Wash water may be contained and removed from the site.

2. Construction Window for Driving of Temporary Piles and Sheet Piles for Cofferdams

Driving temporary piles for construction of the new bridge, trestles to aid in removing the old bridge, falsework, and cofferdams will occur during the first year of construction, between June 15 and October 31. If additional time is necessary to complete these items, the work will continue during the second year of construction between September 15 and October 31.

3. Revegetation Plan

The project proposes to restore self-sustaining native vegetative cover, appropriate to the habitat type, to areas disturbed by project construction by replanting 0.24 acres of wetland habitat (disturbed due to construction of a temporary access road) and 1.9 acres of upland habitat impacted by proposed bridge construction. Planting efforts will include replanting a gravel parking area at the south end of the existing bridge with native upland vegetation. Also, areas of old roadbed which fall outside of the new alignment will be obliterated and replanted with native upland vegetation. Site restoration planting will begin after completion of the bridge replacement. Bi-annual monitoring will begin one year after the site restoration is implemented. Additional details of the revegetation plan, including success criteria, can be found in the Ten Mile Bridge Revegetation Plan, July 2005.

F. Hydroacoustic Monitoring

Caltrans proposes to conduct a hydroacoustic monitoring program during construction. Underwater sound pressure levels during pile driving will be monitored in accordance with the Hydroacoustic Monitoring Plan for the Ten Mile River Bridge Replacement Project, dated January 30, 2006. Sound levels will be measured any time a change in hammer type or size occurs. These measurements will be made at a distance of 10 meters and at other various distances, including 100 meters both upstream and downstream of the construction activity and at both edges of the Ten Mile River when possible. The program may attempt to measure closer than 10 meters under certain conditions. The measurements depth, will be 3 meters for water depths of 4 meters or greater. In

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shallower water, the measurement position will be mid-depth. No measurements will be made in water less than 1 meter in depth.

A report will be prepared and submitted 30 days following the completion of marine pile driving activities. This report will contain acoustical information (peak, RMS, and SEL) for all piles where measurements were made.

G. Proposed Eelgrass Mitigation and Monitoring Plan

Caltrans has proposed a program to monitor and mitigate for impacts to aquatic areas vegetated with eelgrass (*Zostera marina*) in the Ten Mile River estuary. The goal of the program is to minimize effects on eelgrass populations in the areas temporarily affected by construction activities and replant those areas that have shown a significant decrease in density. To accomplish this goal, Caltrans or their contractor will undertake the following:

1) Once construction is completed, all areas within the cofferdams will be replanted with eelgrass;

2) A survey and delineation of eelgrass within the river where the trestle, platforms will be placed will be conducted both before and after construction, and;

3) In areas of eelgrass populations within the plots showing a significant decrease in density, healthy eelgrass clusters will be replanted to accelerate the recovery of the eelgrass populations.

Additional details can be found in: Eelgrass Mitigation and Monitoring Plan for the Ten Mile River Bridge Replacement Project, dated April 7, 2006

H. Fish Passage Enhancement Project

To fulfill CDFG's mitigation requirements under CESA, a separate project to enhance fish passage for coho salmon will be undertaken. Project design and environmental clearances will be completed at a later date. The fish passage project(s) will occur at one of the following sites, as accepted by CDFG:

1) Dunn Creek at Post Mile 92.83;

2) An unnamed tributary to Cottaneva Creek at Post Mile 89.20, or;

3) An unnamed tributary to Cottaneva Creek at Post Mile 88.71.

I. Action Area

The action area for a consultation includes all areas affected directly and indirectly by the project. For the purposes of this consultation, the action area consists of the estuarine

water column and the estuarine substrate which may be affected by elevated levels of underwater sound or degraded water quality. It extends from the mouth of the river, approximately 488 meters downstream of the existing bridge, to approximately 500 meters upstream of the bridge. This entire portion of the river is influenced by tides, as depicted on the California Coastal Commission's Coastal Zone Maps.

III. STATUS OF THE SPECIES/CRITICAL HABITAT

This biological opinion analyzes the effects of the proposed action on the following listed salmonids and their designated critical habitat:

Endangered Central California Coast coho salmon. (*Oncorhynchus kisutch*)
Listing determination (70 FR 37160; June 28, 2005)
Critical habitat designation (64 FR 24049; May 5, 1999).

Threatened California Coastal Chinook salmon (*Oncorhynchus tshawytscha*)
Listing determination (70 FR 37160; June 28, 2005)
Critical habitat designation (70 FR 52488; September 2, 2005).

Threatened Northern California steelhead (*Oncorhynchus mykiss*)
Listing determination (71 FR 834; January 5, 2006).
Critical habitat designation (70 FR 52488; September 2, 2005).

A. Species and Critical Habitat Listing Status

NMFS has recently completed an updated status review of 16 salmon Evolutionarily Significant Units (ESU), including California Coastal Chinook salmon and Central California Coast coho salmon (70 FR 37160). NMFS has also recently completed an updated review for ten steelhead ESUs, including Northern California steelhead. The new listing determination concludes that Northern California steelhead will remain listed as threatened and all ten steelhead populations will be newly classified as Distinct Population Segments (DPS), rather than as ESUs (71 FR 834).

B. Species Description and Life History

Coho salmon, Chinook salmon, and steelhead are anadromous fish, spending some time in both freshwater and saltwater. The older juvenile and adult life stages occur in the ocean, until the adults ascend freshwater streams to spawn. Eggs (laid in gravel nests called redds), alevins (gravel dwelling hatchlings), fry (juveniles newly emerged from stream gravels), and young juveniles all rear in freshwater until they become large enough to migrate to the ocean to finish rearing and maturing to adults. Juveniles migrating to the ocean are called smolts. Both smolts and adults go through physiological changes as they emigrate from freshwater to saltwater (smolts) and immigrate to freshwater from saltwater (adults). The timing of migrations, freshwater habitat preferences for spawning and rearing, the duration and location of freshwater and

ocean rearing, distribution in the ocean, age at maturity, and other traits can vary by species. Coho salmon and Chinook salmon die after spawning, whereas steelhead can sometimes survive to spawn again (Shapovalov and Taft 1954, Sandercock 1991, Healy 1991, Busby *et al.* 1996).

1. Coho Salmon

The life history of the coho salmon in California has been well documented (Shapovalov and Taft 1954, Hassler 1987, Weitkamp *et al.* 1995). In contrast to the life history patterns of other anadromous salmonids, coho salmon in California generally exhibit a relatively simple 3-year life cycle. Adult salmon typically begin their immigration from the ocean to their natal streams after heavy late-fall or winter rains breach the sand bars at the mouths of coastal streams (Sandercock 1991). Coho salmon are typically associated with small to moderately-sized coastal streams characterized by heavily forested watersheds, perennially-flowing reaches of cool, high-quality water, dense riparian canopy, deep pools with abundant overhead cover, instream cover consisting of large, stable woody debris and undercut banks, and gravel or cobble substrates (Sandercock 1991). Immigration continues into March, generally peaking in December and January, with spawning occurring shortly after arrival at the spawning ground (Shapovalov and Taft 1954).

The eggs generally hatch after four to eight weeks, depending on water temperature. Survival and development rates depend, in part, on fine sediment levels within the redd. Under optimum conditions, mortality during this period can be as low as 10 percent; under adverse conditions of high scouring flows or heavy siltation, mortality may be close to 100 percent (Baker and Reynolds 1986). McMahon (1983) found that egg and fry survival drops sharply when fines make up 15 percent or more of the substrate. The newly-hatched fry remain in the redd from two to seven weeks before emerging from the gravel (Shapovalov and Taft 1954). Upon emergence, fry seek out shallow water, usually along stream margins. As they grow, juvenile coho salmon often occupy habitat at the heads of pools, which generally provide an optimum mix of high food availability and good cover with low swimming cost (Nielsen 1992). Chapman and Bjornn (1969) determined that larger juveniles tend to occupy the head of pools, whereas smaller juveniles are found further down the pools. As the fish continue to grow, they move into deeper water and expand their territories until, by July and August, they reside exclusively in deep pool habitat. Preferred rearing habitat has little or no turbidity and high sustained invertebrate forage production. Juvenile coho salmon feed primarily on drifting terrestrial insects, much of which are produced in the riparian canopy, and on aquatic invertebrates growing within the interstices of the substrate and in leaf litter in pools. Juvenile coho salmon prefer well shaded pools at least 1 m deep with dense overhead cover; abundant submerged cover composed of undercut banks, logs, roots, and other woody debris; and preferred water temperatures of 12-15° Celsius (C) (Brett 1952, Bell 1991, Reiser and Bjornn 1979, McMahon 1983), but not exceeding 22-25°C (Brungs and Jones 1977) for extended time periods. Growth is slowed considerably at 18°C and ceases at 20°C (Stein *et al.* 1972, Bell 1991).

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In the spring, as yearlings, juvenile coho salmon undergo a physiological process, or smoltification, which prepares them for living in the marine environment. Generally, coho salmon smolts migrate to the ocean from May through July, peaking in April, May, and June (Fukushima and Lesh 1998). Emigration timing is correlated with precipitation events and peak upwelling currents along the coast. Entry into the ocean at this time facilitates more growth and, therefore, greater marine survival (Holtby *et al.* 1990).

2. Chinook Salmon

Chinook salmon are the largest anadromous member of Oncorhynchus. Adults weighing more than 120 pounds have been reported from North American waters (Scott and Crossman 1973, Page and Burr 1991). Chinook salmon exhibit two main life history strategies; ocean-type fish and river-type fish (Healy 1991). Ocean-type fish typically are fall- or winter-run fish that spawn shortly after entering freshwater and their offspring emigrate shortly after emergence from the redd. River-type fish are typically spring- or summer-run fish that have a protracted adult freshwater residency, sometimes spawning several months after entering freshwater. Progeny of river-type fish frequently spend one or more years in freshwater before emigrating.

Chinook salmon in the CC Chinook salmon ESU generally remain in the ocean for two to five years (reviewed in Myers *et al.* 1998 – Appendix B). In the ocean, Chinook salmon from California tend to stay along the California and Oregon coasts, but migration may continue to higher latitudes if oceanographic conditions are appropriate (Allen and Hassler 1986). Some Chinook salmon return from the ocean to spawn one or more years before full sized adults return, and are referred to as jacks (males) and jills (females). Fall-run Chinook salmon generally enter rivers from October through January (Fukushima and Lesh 1998). These fish typically enter freshwater at an advanced stage of maturity, move rapidly to their spawning areas on the mainstem or lower tributaries of rivers, and spawn within a few weeks of freshwater entry. Fall-run Chinook salmon typically spawn in the lower reaches of rivers and tributaries at elevations of 200 to 1,000 ft. Run timing is also, in part, a response to stream flow characteristics.

Egg deposition must be timed to ensure that fry emerge during the following spring at a time when the river or estuary productivity is sufficient for juvenile survival and growth. Adult female Chinook salmon prepare redds in stream areas with suitable gravel composition, water depth, and velocity. Spawning generally occurs in swift, relatively shallow riffles or along the edges of fast runs at depths greater than 24 centimeters (cm). Optimal spawning temperatures range between 5.6 and 13.9°C. Redds vary widely in size and location within the river. Preferred spawning substrate is clean, loose gravel, mostly sized between 1.3 and 10.2 cm, with no more than 5 percent fines. Gravels are unsuitable when they have been cemented with clay or fines or when sediments settle out onto redds, reducing intergravel percolation. Minimum intergravel percolation rate depends on flow rate, water depth, and water quality. The percolation rate must be adequate to maintain oxygen delivery to the eggs and remove metabolic wastes. The Chinook salmon's need for a strong, constant level of subsurface flow may indicate that suitable spawning habitat is more limited in most rivers than superficial observation

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would suggest. After depositing eggs in redds, adult Chinook salmon guard the redd from 4 to 25 days before dying.

Chinook salmon eggs incubate for 90 to 150 days, depending on water temperature. Successful incubation depends on several factors including DO levels, temperature, substrate size, amount of fine sediment, and water velocity. Maximum survival of incubating eggs and pre emergent fry occurs at water temperatures between 5.6 and 13.3°C with a preferred temperature of 11.1°C. Fry emergence begins in December and continues into mid April (Leidy and Leidy 1984). Emergence can be hindered if the interstitial spaces in the redd are not large enough to permit passage of the fry. In laboratory studies, Bjornn and Reiser (1991) observed that Chinook salmon and steelhead fry had difficulty emerging from gravel when fine sediments (6.4 mm or less) exceeded 30 to 40 percent by volume.

After emergence, Chinook salmon fry seek out areas behind fallen trees, back eddies, undercut banks, and other areas of bank cover (Everest and Chapman 1972). As they grow larger, their habitat preferences change. Juveniles move away from stream margins and begin to use deeper water areas with slightly faster water velocities, but continue to use available cover to minimize the risk of predation and reduce energy expenditure. Fish size appears to be positively correlated with water velocity and depth (Chapman and Bjornn 1969, Everest and Chapman 1972). Optimal temperatures for both Chinook salmon fry and fingerlings range from 12 to 14°C, with maximum growth rates at 12.8°C (Boles 1988). Chinook salmon feed on small terrestrial and aquatic insects and aquatic crustaceans. Cover, in the form of rocks, submerged aquatic vegetation, logs, riparian vegetation, and undercut banks provide food, shade, and protect juveniles from predation. The low flows, high temperatures, and sand bars that develop in smaller coastal rivers during the summer months favor an ocean-type life history (Kostow 1995). With this life history, smolts typically emigrate as subyearlings during April through July (Myers *et al.* 1998). The ocean-type Chinook salmon in California tend to use estuaries and coastal areas for rearing more extensively than stream type Chinook salmon. The brackish water areas in estuaries moderate the physiological stress that occurs during parr smolt transitions.

3. Steelhead

General reviews for steelhead in California document much variation in life history (Shapovalov and Taft 1954, Barnhart 1986, Busby *et al.* 1996, McEwan and Jackson 1996). Juvenile steelhead live 1 to 4 years in freshwater before smolting and emigrating, then spend 1 to 4 years maturing in the ocean. Steelhead spawn at 2 to 8 years, and may spawn 1 to 4 times over their life. Although variation occurs, in coastal California, steelhead usually live in freshwater for 2 years, then spend 1 or 2 years in ocean before returning to their natal stream to spawn. Steelhead exhibit much variation in migration timing too. Steelhead can be divided into two reproductive ecotypes, based upon their state of sexual maturity at the time of river immigration and the duration of their spawning migration: stream maturing and ocean maturing. Stream maturing steelhead enter freshwater in a sexually immature condition and require several months to mature

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and spawn; whereas, ocean maturing steelhead enter freshwater with well developed gonads and spawn shortly after river entry. These two reproductive ecotypes are more commonly referred to by their season of freshwater entry (*i.e.*, summer [stream maturing] and winter steelhead [ocean maturing]). Summer steelhead typically immigrate between May and October and spawn in January and February; winter steelhead typically immigrate between November and April spawning soon after reaching the spawning grounds.

Survival to emergence of steelhead embryos is inversely related to the proportion of fine sediment in the spawning gravels. However, steelhead are slightly more tolerant than other salmonids, with significant reductions in survival when fines of less than 6.4 millimeters (mm) comprise 20-25 percent of the substrate. Fry typically emerge from the gravel two to three weeks after hatching (Barnhart 1986). Upon emerging from the gravel, fry rear in edgewater habitats and move gradually into pools and riffles as they grow larger. Older fry establish territories which they defend. Cover is an important habitat component for juvenile steelhead, both as a velocity refuge and as a means of avoiding predation (Shirvell 1990, Meehan and Bjornn 1991). Steelhead, however, tend to use riffles and other habitats not strongly associated with cover during summer rearing more than other salmonids. Young steelhead feed on a wide variety of aquatic and terrestrial insects, and emerging fry are sometimes preyed upon by older juveniles. In winter, juvenile steelhead become inactive and hide in available cover, including gravel or woody debris. Rearing steelhead juveniles prefer water temperatures of 7.2-14.4°C and have an upper lethal limit of 23.9°C (Barnhart 1986, Bjornn and Reiser 1991). They can survive in water up to 27°C with saturated dissolved oxygen conditions and a plentiful food supply. Fluctuating diurnal water temperatures also aid in survivability of salmonids (Busby *et al.* 1996).

In Waddell Creek, in Santa Cruz County, Shapovalov and Taft (1954) found steelhead juveniles migrating downstream at all times of the year, with the most juvenile steelhead emigrating during spring and summer.

C. Status of Species and Critical Habitat

In this biological opinion, NMFS assesses the status of each species by examining four types of information, all of which help us understand a population's ability to survive. These population viability parameters are; abundance, population growth rate, spatial structure, and diversity (McElhany *et al.* 2000). While there is insufficient information to evaluate these population viability parameters in a quantitative sense, NMFS has used existing information to determine the general condition of populations in each ESU or DPS and factors responsible for their current status.

1. CCC Coho Salmon

A comprehensive review of estimates of historic abundance, decline, and present status of coho salmon in California is provided by Brown *et al.* (1994). They estimated that coho salmon annual spawning population in California ranged between 200,000 and 500,000

fish in the 1940s, which declined to about 100,000 fish by the 1960s, followed by a further decline to about 31,000 fish by 1991. Brown *et al.* (1994) concluded that the California coho salmon population had declined more than 94 percent since the 1940s, with the greatest decline occurring since the 1960s. More recent population estimates vary from approximately 600 to 5,500 adults (Brown *et al.* 1994). Recent NMFS status reviews (NMFS 2001, NMFS 2003, NMFS 2005) indicate that the CCC coho salmon ESU is likely continuing to decline in abundance.

CCC coho salmon have also experienced acute range restriction and fragmentation. Adams *et al.* (1999) found that in the mid 1990s coho salmon were present in 51 percent (98 of 191) of the streams where they were historically present, and documented an additional 23 streams, within the CCC coho salmon ESU, in which coho salmon were found for which there were no historical records.

Recent genetic research in progress by both the NMFS Southwest Fisheries Science Center and the Bodega Marine Laboratory has documented a reduction in genetic diversity within subpopulations of the ESU (D. Logan 2003). The influence of hatchery fish on wild stocks has also contributed to the lack of diversity through outbreeding depression[2] and disease.

Available information suggests that CCC coho salmon abundance is very low, and the ESU is not able to produce enough offspring to maintain itself (population growth rates are negative). CCC coho salmon have experienced range constriction, fragmentation, and a loss genetic diversity. Many subpopulations that may have acted to support the species overall numbers and geographic distribution, have likely been lost. The extant subpopulations of CCC coho salmon may not have enough fish to survive additional natural and human caused environmental change. While the amount of data supporting these conclusions is not extensive, NMFS is unaware of information that suggests a more positive assessment of the condition of the ESU and its critical habitat. Recent status reviews for CCC coho salmon conclude that this ESU is presently in danger of extinction (NMFS 2001, NMFS 2003, NMFS 2005).

a. Status of CCC Coho Salmon in the Ten Mile River Watershed

Weitkamp *et al.* (1995) states that the Ten Mile River coho salmon population of 160 adults was identified as "native" fish, lacking a history of supplementation. In the winter of 1995/1996, Maahs (1997), estimated that between 21 and 83 adult coho salmon spawned in the South Fork Ten Mile River, and 25 and 101 adult fish were in the Little North Fork Ten Mile River. Maahs (1996) estimated that adult coho salmon escapement in seven Ten Mile River tributaries ranged from 78 to 351 spawners.

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[2] Outbreeding depression is the loss of genetic and behavioral diversity in a population through the introduction of parental genomes that are not well adapted to local environments. Less native genetic material is passed to subsequent generations when native fish hybridize with hatchery fish instead of propagating with other purely native salmon.

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Smolt downstream outmigrant trapping was conducted in 1996, and 1997 (Maahs 1996, Maahs 1997). The 1996 combined smolt outmigrant estimates for yearling coho salmon in the South Fork Ten Mile, including the tributaries Cambell Creek, and Smith Creek, were 616 fish (CRWQCB 2001), whereas the 1997 coho salmon smolt outmigant estimate for these same streams was 2,967. This substantial difference is likely due to variation in interannual spawning abundance caused by fluctuations in environmental conditions such as ocean productivity.

Based on NMFS's review of smolt outmigration data, carcass surveys, and summer juvenile surveys (Maah 1996, Maahs 1997, Ambrose and Hines 1994) , the Ten Mile River coho salmon brood lineages appear to exist in what NMFS considers as strong, medium, and weak brood year population numbers (relative to each other). The data suggests that the adult coho salmon that spawn in "2001/2002", "2004/2005", and "2007/2008" brood are the strongest brood, typically distributed throughout more of the watershed in higher numbers than the other two brood years. The coho salmon brood year that appears to be at medium strength, relative to the other brood years, is the "2000/2001", "2003/2004", and "2006/2007" brood year. The weakest brood year, which appears in very low numbers in the Ten Mile River watershed, is the "2002/2003", "2005/2006", and "2008/2009" brood year.

2. CC Chinook Salmon

Rigorous population estimates for CC Chinook salmon are lacking. Myers *et al.* (1998) reviewed early estimates and reported estimated historic (prior to 1965) Chinook salmon escapement for the Eel River as 55,500. Recent estimates of abundance within the Eel River exceeds 4,000 Chinook salmon and show a -29.7 percent trend in abundance from 1987-1997 (Myers *et al.* 1998). Evidence suggests that CC Chinook salmon populations have been extirpated or nearly extirpated in the southern part of the ESU, or are extremely low in abundance – Chinook salmon in the Russian River are an exception. Also, an apparent loss of the spring-run Chinook life history in the Eel River Basin and elsewhere in the ESU indicates risks to the diversity of the ESU. Although there are few data available, recent status reviews for CC Chinook salmon conclude that population abundance levels remain depressed relative to historical levels and that this ESU is presently "likely to become endangered" (NMFS 2001, NMFS 2005). Recently NMFS evaluated the listing status of CC Chinook salmon and maintained the threatened status of Chinook salmon (70 FR 37160).

a. Status of CC Chinook salmon in the Ten Mile River Watershed

Limited data are available for Chinook salmon in the Ten Mile River watershed (CRWQCB 2001). Chinook salmon were observed in the Ten Mile River watershed by Shapovalov (1948). Adult Chinook salmon carcass surveys by Maahs and Gilliard (1994), found Chinook salmon scattered throughout the Ten Mile River watershed in relatively low numbers. Estimates made based on these carcass surveys for Chinook salmon ranged from 34 to 54 fish in 1989-90, and 51 to 154 fish in 1991-92. Maahs and

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Gilliard (1994) concluded that low numerical returns of Chinook salmon may have resulted from unfavorable river conditions, which reduced natural production.

3. NC Steelhead

Based on the limited data available (dam counts of portions of stocks in several rivers), NMFS' initial status review of NC steelhead (Busby *et al.* 1996) determined that population abundance was very low relative to historical estimates (1930s and 1960s dam counts), and recent trends were downward in most stocks. Overall, population numbers are severely reduced from pre-1960s levels, when approximately 198,000 adult steelhead migrated upstream to spawn in the major rivers used by this DPS (Busby *et al.* 1996, 65 FR 36074). Updated status reviews reach the same conclusion, and noted the poor amount of data available, especially for winter run steelhead (NMFS 1997, Adams 2000, NMFS 2005). The information available suggests that the population growth rate is negative. Comprehensive geographic distribution information is not available for this DPS, but steelhead remain widely distributed (NMFS 1997). Dams on the Mad River and Eel River block large amounts of habitat historically used by NC steelhead (Busby *et al.* 1996). Hatchery practices have exposed the DPS to genetic introgression and the potential for deleterious interactions between native stock and introduced steelhead. Historical hatchery practices at the Mad River hatchery are of particular concern, and included out-planting of non-native Mad River hatchery fish to other streams in the DPS and the production of non-native summer steelhead (65 FR 36074). The conclusion of the most recent status review (NMFS 2005) echoes that of previous reviews. Abundance and productivity in this DPS are of most concern, relative to NC steelhead spatial structure (distribution on the landscape) and diversity (level of genetic introgression). The lack of data available also remains a risk because of uncertainty regarding the condition of some stream populations (NMFS 2005).

a. Status of Steelhead in the Ten Mile River Watershed

Maahs (1996 and 1997), found steelhead spawning throughout most of the Ten Mile River watershed. The mainstem Ten Mile River, the Little North Fork, Patsy Creek, the Clark Fork and its tributaries, and the South Fork including Campbell and Churchman creeks were found to be consistent spawning locations for adult NC steelhead (Maahs 1996 and 1997). Summer rearing data collected by Ambrose and Hines (1998) found the high juvenile steelhead densities in the South Fork Ten Mile River at Camp 28. Outmigration data collected by Maahs (1996) estimated a total of 22,128 yearling smolt steelhead emigrating from the South Fork Ten Mile, Campbell Creek, and Smith Creek. The total number of steelhead smolts emigrating from these streams decreased in 1997 to an estimated 7,239 smolts.

4. Critical Habitat

Critical habitat is defined in section 3(5)(A) of the Endangered Species Act (ESA) as "the specific areas within the geographical area occupied by the species . . . on which are

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found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by the species . . . upon a determination by the Secretary of Commerce (Secretary) that such areas are essential for the conservation of the species" (see 16 U.S.C. 1532(5)(A). The term "conservation", as defined in section 3(3) of the ESA, means ". . . to use and the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this Act are no longer necessary" (see 16 U.S.C. 1532(3). Therefore, critical habitat is the geographic area and habitat functions necessary for the recovery of the species.

The condition of critical habitat for the Chinook salmon and coho salmon ESUs and the steelhead DPS has been degraded from conditions known to support viable salmonid populations. These conditions are, in part, the result of the following human-induced factors affecting critical habitat ; logging, agricultural and mining activities, urbanization, stream channelization, dams, wetland loss, and water withdrawals, including unscreened diversions for irrigation (reviewed in NMFS 2005). Impacts of concern include alteration of stream bank and channel morphology, reduced surface flow, alteration of water temperatures, loss of spawning and rearing habitat, fragmentation of habitat, loss of downstream recruitment of spawning gravels and large woody debris, degradation of water quality, removal of riparian vegetation resulting in increased stream bank erosion, increases in erosion entry to streams from upland areas, loss of shade (higher water temperatures), and loss of nutrient inputs. Depletion and storage of natural river and stream flows have drastically altered natural hydrologic cycles in many of the streams used by the ESUs and DPSs.

IV. ENVIRONMENTAL BASELINE

This biological opinion analyses the area affected directly and indirectly by the proposed bridge replacement project. The action area for this biological opinion includes the construction site in the Ten Mile River Estuary, approximately 500 meters upstream and downstream from the construction site, and the entire width of the estuary within these areas (approximately 150 meters).

A. Status of the Species in the Action Area

CCC coho salmon, CC Chinook salmon, and NC steelhead utilize the Ten Mile River estuary as a migration corridor during adult and smolt life history phases. Adult steelhead, coho salmon and Chinook salmon leave the ocean and enter the Ten Mile River estuary during the fall and winter months en route to upstream areas to spawn. For juvenile anadromous salmonids, the estuary provides a critical link between freshwater and ocean habitat. The transition from freshwater to the open ocean requires juvenile salmonids to undergo physiological and behavioral changes associated with smolt transformation (Moser *et al.* 1991). Estuaries provide the spatial salinity gradient necessary during the physiological adaptation from freshwater to saltwater as well as a

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rich foraging environment that offers a last opportunity for growth before entering the ocean (Healy 1982).

Little data is available regarding the use of the Ten Mile River estuary by salmon and steelhead juveniles for rearing. During the late summer months a sand bar often closes the mouth of the estuary (Maahs 1998). The resulting freshwater lens in the estuary creates habitat that can be used by juvenile steelhead or salmon. Summer rearing by steelhead and coho salmon juveniles has been observed in estuaries along the Northern California coast such as the Navarro River estuary and the Albion River estuary (S. Cannata 2006). D. Wright (2006) identified juvenile steelhead rearing in the Ten Mile River estuary, but not observed any juvenile coho salmon. Chinook salmon in Ten Mile River are typically ocean-type fish and, thus, juveniles are outmigrating as smolts during the spring and early summer of their first year. Juvenile Chinook salmon are not expected to oversummer in the Ten Mile River estuary.

B. Watershed Characteristics of the Ten Mile River Watershed

The Ten Mile River watershed drains about 310.8 square kilometers of forested, coastal watershed in Mendocino County, California. The mouth of the Ten Mile River is about 16 kilometers north of Fort Bragg. Elevation ranges from sea level to 987.5 meters at Strong Peak. All land is privately owned, with Hawthorne Timber Company, LLC (managed by Campbell Timberland Management, LLC), owning about 85% of the watershed. Three small, non-industrial timber owners and a handful of other residences are located in the watershed. Average annual precipitation ranges from about 102 centimeters near the coast to greater than 178 centimeters at higher elevations in the northern and eastern portions of the watershed. Most precipitation occurs as rainfall.

1. Habitat Conditions in the Action Area

Information is limited with regard to salmonid habitat conditions in the Ten Mile River Estuary. The Ten Mile River is designated as "Water Quality Limited" by the State Water Resources Control Board. Pollutants and stressors and their respective potential sources include sedimentation and siltation (silviculture, road construction and maintenance) and temperature, removal of riparian vegetation, nonpoint source pollution.

From February through June, salmonid smolts use the estuary as a transition area as they ready themselves for the ocean phase of their life history. Tidal influence in the estuary extends upstream approximately 5.1 kilometers (D. Wright, 2006, L. Embree, 2005).

A variety of factors currently impact salmonid habitat within the Ten Mile River watershed and estuary. Continued timber management causes increased delivery of fine and course sediment to stream channels that contributes to a decrease in overall salmonid habitat quality in the watershed. Chemicals such as pesticides, herbicides, fertilizers, and fire retardants will continue to be used in the action area. Changes to riparian vegetation and associated organic input into aquatic systems, changes in aquatic invertebrate communities, and increased algae production effects habitat conditions in the action area.

Due to the lack of specific information, the effects of chemical applications in the action area are unknown.

2. Factors Affecting the Species and Critical Habitat in the Action Area

According to Margaret Perry, whose family has owned property on the south side of the river since around the 1930's, historically there were livestock ranches, and some farming (hay for example) in the Ten Mile River watershed (L. Embree 2005). There was not much timber use, but eventually there were timber camps in the Ten Mile River area. Margaret Perry also reported to Caltrans that that prior to the 1964-65 flood, the channel was deeper.

The Ten Mile River watershed was first listed on the 303(d) water quality limited list by the State of California in 1998, pursuant to the Federal Clean Water Act. Sediment impacts to cold water fisheries resources were the cause for the listing. Low levels of cattle grazing, hay production adjacent to the estuary, and past timber harvest have all likely increased the amount of sediment and turbidity in the watershed which has likely had some impact on the Ten Mile River estuary over the past 50 years. Timber practices have improved with the introduction of the Z'berg-Nejedly Forest Practices Act of 1973. Sediment reductions through the improvement of road building and harvest methods have reduced the past erosion problems in the Ten Mile River watershed. Available information indicates that conditions within the Ten Mile River estuary are currently functioning to provide habitat for adult or smolt migration, but conditions for extended rearing may continue to be impaired.

V. EFFECTS OF THE ACTION

Pursuant to section 7(a)(2) of the ESA (16 U.S.C. § 1536), Federal agencies are directed to ensure that their activities are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat. This biological opinion assesses the potential effects of the proposed bridge replacement project on federally listed CCC coho salmon, CC Chinook salmon and NC steelhead, and their designated critical habitats. The proposed bridge replacement project is likely to adversely affect listed salmonids and critical habitats. An overview of the action is provided in the *Description of the Proposed Action* section of this biological opinion. In the *Status of the Species and Critical Habitat* and *Environmental Baseline* sections of this biological opinion, NMFS provided an overview of the threatened and endangered species and critical habitats that are likely affected by the activity under consultation.

Regulations that implement section 7(a)(2) of the ESA require biological opinions to evaluate the direct and indirect effects of Federal actions and actions that are interrelated with or interdependent to the Federal action to determine if it would be reasonable to expect them to appreciably reduce listed species' likelihood of surviving and recovering in the wild by reducing their reproduction, numbers, or distribution (16 U.S.C. §1536, 50 CFR 402). Section 7 of the ESA and its implementing regulations also require biological

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opinions to determine if Federal actions would destroy or adversely modify critical habitat (16 U.S.C. §1536).

The potential adverse effects of the proposed construction of the new Ten Mile River Bridge and the demolition of the existing bridge that it replaces are primarily associated with elevated underwater sound pressure levels generated during pile driving. However, other potential impacts to listed salmonids and designated critical habitat include relocation of listed salmonids from the dewatered cofferdams, turbidity associated with construction, and ground disturbance for areas associated with the bridge construction.

A. Impacts Related to Construction

The installation of steel piles with an impact hammer is expected to result in adverse effects to listed salmonids due to high levels of underwater sound that will be produced. Although adverse effects to fish from elevated levels of underwater sound are well documented for explosives (Christian 1973, Fitch and Young 1948, Gaspin 1975, Keevin and Hempen 1997) and air guns (Engas *et al.* 1996, McCauley *et al.* 2003, Pearson *et al.* 1992, Popper *et al.* 2005), there is less information regarding the effects on fish from underwater sound pressure waves produced during the installation of piles (Abbott and Bing-Sawyer 2002, Abbott and Reyff 2004, Abbott *et al* 2005, Caltrans 2001, Caltrans 2003, Caltrans 2004, Nedwell *et al.* 2003, Vagle 2003). Laboratory research on the effects of sound on fish has used a variety of species and sounds (Banner and Hyatt 1973, Hastings *et al.* 1996, Popper and Clarke 1976, Scholik and Yan 2002, Turnpenny *et al.* 1994). Experimental data found in the literature concerning the effects of sound on aquatic animals are not reported in a consistent manner, and most of these studies did not examine the type of sound generated by pile driving. Thus, it is difficult to directly apply the results of those studies to pile driving effects on listed salmonids at the Ten Mile River Bridge Replacement Project.

Prior to a discussion of the project specific effects from underwater sound pressure levels generated during pile driving at the Ten Mile River Bridge Replacement Project, a brief introduction to the subject of the effects of sound on fish is presented below.

1. <u>Effect of Sound on Fish</u>

The degree to which an individual fish exposed to underwater sound will be affected (from a startle response to immediate mortality) is dependent on a number of variables, including:

1) Species of fish;
2) Size of the fish;
3) Presence of a swimbladder;
4) Physical condition of the fish;
5) Fish behavior;
6) Sound pressure intensity and frequency;
7) Shape of the waveform (rise time);

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8) Exposure to multiple strikes;
9) Depth of the water around the pile;
10) Depth of the fish in the water column;
11) Amount of air in the water;
12) The size and number of waves on the water surface;
13) Bottom substrate composition and texture;
14) Effectiveness of a sound attenuation system, if utilized, and
15) Presence of predators.

a. Physical Injuries

Prior to the 2000s, physical injuries to fish exposed to elevated underwater sound pressure levels produced during the installation of piles in the aquatic environment had not been documented. In 2000, observations were made of fish killed during the installation of steel pipe piles with an impact hammer at the Port of Vancouver, British Columbia (Vagle 2003) and in San Francisco Bay, California (Caltrans 2001). Since that time, similar observations have been made in other areas.

It has long been known that underwater explosives can cause injury and mortality to fish. The Department of the Navy conducted a series of experiments to determine the effects on fish from underwater explosions (Christian 1973, Gaspin 1975, Goertner *et al.* 1994) which resulted in significant differences in effects to fish depending on whether or not they had swimbladders. Thus it is the swimbladder, inflated with gas, which expands rapidly as the pressure wave passes through the fish, that likely causes the observed injuries to internal organs (Keevin and Hempen 1997). An important characteristic of the underwater sound that causes injury is the frequency. During pile installation, most energy is contained within the frequency range (100-1000 Hertz) which results in reverberation of the swimbladder. Studies have shown that the most susceptible tissues that are injured during exposure to underwater sound produced from pile driving are the soft-tissue organs surrounding the swimbladder, such as the liver and kidney (Abbott and Bing-Sawyer 2002, Caltrans 2001, Caltrans 2003).

Although underwater sound pressure waves generated during pile driving are different in several ways from those generated during explosions, the mechanism of injury (*i.e.* swimbladder expansion) may be similar. The most important differences between the two are the repetitive nature of pile driving and the overpressure-underpressure oscillations within the pile driving signal. When combined with the multiple strikes to which fish will be exposed, these repetitive oscillations likely cause the swimbladder to expand (underpressure) and contract (overpressure) and press against the internal organs. Although any single pulse (depending on its magnitude) may not result in injury to the internal organs, the repetitive exposure to the sound produced during pile driving is likely to result in injury.

Popper *et al.* (2006) reports that nothing is known about the cumulative effects of pile driving. If one pile driving strike is quickly followed by a second strike, there may be a cumulative effect since there is no time for recovery from the first strike. However, if the

second strike follows the first by some greater period, the affected system may show some or complete recovery from the effects of the first strike (Popper *et al.* 2006). At this point, little is known of the accumulation of effects on fish resulting from strikes that are variably spaced in time and there is no existing methodology by which the level of impact can be quantified.

Previously, NMFS used peak sound pressure levels to define the onset of injury to salmonids. In 2004, Caltrans contracted with prominent experts in the field of underwater acoustics to review existing literature on the effects of underwater sound on fish. The result of that effort (Hastings and Popper 2005) indicated that the use of the Sound Exposure Level (SEL) metric, which is expressed as decibels re one micropascal squared-sec[3], would be a better metric to use to correlate physical injury to fish from underwater sound pressure produced during the installation of piles. The primary rationale for this new metric was the ability to sum the energy over multiple pulses (*i.e.* hammer strikes), which cannot be accomplished with peak pressure. Using SEL, the exposure of fish to a total amount of energy (*i.e.* dose) can be used to determine a physical injury response. Hastings and Popper (2005) used data collected by Yelverton *et al.* (1975) to calculate SEL from explosive impulse (psi-msec) data that suggested no injury would occur to the smallest exposed fish (guppy, *Poecilia* (*Lebistes) reticultata*) at 193 dB_{SEL}. Because there is a relatively small difference (~3 dB) between the "no injury" line and the "50% mortality line" for this species as presented by Yelverton *et al.* (1975), and because there is uncertainty extrapolating from explosive data, Popper et al. (2006) suggest use of a single strike criteria of 187 dB_{SEL} for pile driving. The 187 dB_{SEL} criteria represents a 75% reduction in the sound exposure and is likely an appropriate threshold to set for the onset of injury to small fish (in this case juvenile salmonids). Yelverton *et al.* (1975) also reported that larger fish are less vulnerable to physical injuries than smaller fish from exposure to similar levels of underwater sound. Results from Yelverton *et al.* (1975) suggest there is an approximately three decibel difference in sound exposure to produce similar effects between a smolt-sized salmonid and an adult salmonid. Therefore, available information suggests 190 dB_{SEL} may be used as the threshold of injury to adult salmonids.

The use of the SEL metric would be straightforward if only a single strike of the hammer was needed to install a given pile. Unfortunately, it typically takes a wide range (from tens to thousands) of strikes to install piles of various sizes in various substrate. In addition, assumptions must be made regarding the behavior of the fish and the recovery time of tissue being affected in order to determine the response (*i.e.* injury) of the fish.

Although there may be some tissue recovery between strikes, there were data collected during pile installation (Abbott and Bing-Sawyer 2002, Caltrans 2003) that suggest that cumulative injury impacts are likely to occur with repeated exposure to sound pressure waves from pile strikes. Hamernik *et al.* (1987) reported a dose-dependent increase in hearing loss of chinchilla as the number of strikes increased from 1, 10, and 100 (presented at 1 impulse/3 sec). However, at this time there are no empirical data

[3] In the remainder of this document, SELs are referenced to one micropascal squared-second.

available to suggest a method for calculating accumulated energy to determine potential physical effects to listed salmonids and other fish species.

There is also a question of tissue recovery during the interval of time between each pile being installed. Typically, several piles are installed on any given day, with tens of minutes between the completion of one pile and the initial driving of the next. Based on the normal behavior patterns of migrating salmonids, individual fish typically move in and out of the affected area within one day, and possibly could move through a construction site within minutes. This would not be the case if the construction site were located in an area where either anadromous salmonids were spawning or juvenile salmonids were rearing.

b. Hearing Damage and Behavioral Response

Sound is a major form of underwater communication for fish, so a functioning auditory system is essential for fish to survive. The structure of the fish inner ear is similar to that of other vertebrates: each ear has three semicircular canals and three otolithic organs, the utricle, saccule, and lagena. The semicircular canals and otolithic chambers are interconnected and filled with endolymphatic fluid. The swimbladder may act somewhat as an eardrum by responding to the sound pressure waves, depending on the species of fish. The motion of the swimbladder radiates a secondary signal to the inner ear. This provides the necessary particle movement for otolithic/auditory nervous stimulation, especially in species having the shortest distance between the swimbladder and the auditory apparatus (pars inferior) (Moyle and Cech 1988).

The literature indicates damage to hearing by intense sound depends on auditory threshold and will vary from species to species (Popper and Fay 1973). Auditory thresholds are measured as the lowest sound pressure, at a certain frequency, to which the animal is sensitive. These thresholds are expressed as the root mean squared (rms) of the sound pressure, in dB (re: 1μPa)[4]. Damage to hearing is normally measured as the decrease in sensitivity (i.e., an increase in the auditory threshold) when compared to the pre-exposure condition, and may be expressed decibels.. Some fish have hearing thresholds as low as 50 dB_{rms} while others have thresholds as high as 150 dB_{rms}. Enger (1981) exposed 26 cod to continuous tones of 180 dB_{rms} at frequencies from 50 to 400 Hertz (Hz) for one to five hours and found destruction of auditory hair cells in the saccule. The cod has a hearing threshold of 75-80 dB_{rms} between 100 and 200 Hz (Chapman and Hawkins, 1973), so 180 dB_{rms} is about 100 dB above threshold. For Atlantic salmon, Hawkins and Johnstone (1978) reported best sensitivity of 95-100 dB_{rms} between 100 and 200 Hz. Since the 100-200 Hz is the bandwidth of best sensitivity for both cod and Atlantic salmon, Hastings (2002), in support of the Caltrans biological assessment of the Benicia-Martinez New Bridge Project, stated she would expect to see damage of auditory hair cells in salmon occurring with exposure to continuous sound at about 200 dB_{rms}. The peak pressure associated with a continuous sound of 200 dB_{rms} is

[4] In the remainder of this document, rms pressure levels are referenced to one micropascal.

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equivalent to 203 dB_{peak}, thus Hastings (2002) concludes hearing damage to the sensory hearing cells of salmon onsets at a sound level of 203 dB_{peak}.

Hastings (1995) found destruction of auditory sensory cells when she and her colleagues exposed goldfish to continuous tones of 189, 192, and 204 dB_{peak} at 250 Hz and 197 dB_{peak} at 500 Hz for approximately two hours. Four fish were exposed to each set of conditions and destruction of ciliary bundles was found to correlate with sound pressure level at a 95% confidence level. Hastings *et al.* (1996) also found destruction of sensory cells in the inner ear of oscars four days after being exposed to continuous sound for one hour to 180 dB_{peak} at 300 Hz. The authors found no damage in fish allowed to survive for only one day after exposure, suggesting that damage may develop slowly.

There exists much uncertainty regarding how fish respond behaviorally to underwater sound. Sonalysts (1997) suggested that although fish (including Atlantic salmon) exhibit a startle response during the first few acoustic exposures, they do not move away from areas of very loud underwater sounds and can be expected to remain in the area unless they are carried away by currents or normal movement patterns. This was observed during the installation of steel piles at the San Francisco-Oakland Bay Bridge Project (SFOBB Project) (Caltrans 2001). The data presented by Caltrans in reports regarding the SFOBB project suggest that 25 minutes following initiation of pile driving, a school of fish swam too close to the pile and were killed, as indicated by a rapid rise in the number of foraging birds. These results suggests that fish do not response by exiting the area of elevated sound levels and could remain in the vicinity of a construction site during pile driving activities.

Alternatively, observations by Feist *et al* (1992) suggest juvenile salmon may depart areas subjected to elevated sound levels from pile driving. In the early 1990s, Feist *et al.* (1992) made comparisons between juvenile salmon schooling behavior in areas subjected to pile driving/construction and other areas where there was no pile driving/construction pile driving operations in Puget Sound. These results indicate pile driving disrupted juvenile salmon behavior. Though no underwater sound measurements are available from that study, there were fewer schools of fish in the pile-driving areas than in the non-pile driving areas (Feist *et al.* 1992). These results suggest that pile-driving operations may result in a disruption in normal rearing, foraging, or migratory behavior.

Sonalysts (1997) reported that they performed reaction testing with caged Atlantic salmon at a wide range of sound pressure levels and frequencies. They stated that although some avoidance was noted at certain specific levels and frequencies, no avoidance response was seen when the sound pressure levels (likely rms) were over 180 dB. The report also included a brief discussion of previously unreported studies that show that beyond a brief startle response associated with the first few acoustic exposures, fish do not move away from areas of very loud noises and are expected to remain in the area unless they are carried away by currents.

To determine the level of underwater sound that would elicit a behavioral response, Turnpenny *et al.* (1994) exposed a variety of fish species to varying levels of sound and

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frequency. No significant avoidance was found for trout at exposure levels (metric not specified) of up to 150 dB, although a reaction threshold of around 170 dB was observed. The authors used pure tone bursts, which cause an effect at a lower sound pressure level due to the higher duty cycle of the signal.

During the construction of the Benicia-Martinez Bridge Project in April 2002, observations were made during pile driving that suggest small fish subject to the exposure of elevated underwater sound pressure levels can be vulnerable to predation. The stomach of a piscivorous striped bass killed by high underwater sound pressure levels was examined and found to contain several freshly consumed juvenile herring (R. Blizard 2002). Although necropsies were not performed on the juvenile herring, the consensus of the biologists present at the site was that the striped bass was feeding heavily on killed, injured, or stunned herring as it too swam into the zone of lethal sound pressure levels.

The literature suggests that there may be adverse effects from elevated levels of sound stemming from shifts in hearing, physical hearing damage, or equilibrium problems (Turnpenny *et al.* 1994; Hastings *et al.* 1996). Salmonids exposed to elevated levels of sound lower than those thought to cause physical injury to auditory tissue are expected to recover without permanent hearing damage. However, they will be highly susceptible to predation during recovery. Mesa (1994) conducted laboratory experiments to examine the predator avoidance ability and physiological stress responses of juvenile Chinook salmon subjected to various stressors. Test fish were subject to agitation to cause disorientation and occasional injury. When equal numbers of stressed and unstressed fish were exposed to predatory fish, significantly more stressed fish were eaten by the predators. Mesa's (1994) results suggest that juvenile salmonids exposed to various stressors regain their full ability to avoid predators within one hour of exposure.

Given the aforementioned discussion, it appears that physical damage to the auditory system of salmonids is likely to occur at levels at or above 200 dB_{rms}, which is near the single strike threshold (187 dB_{SEL}) at which physical injury to the organs adjacent to a fish's swimbladder is estimated to occur. On the other hand, there is uncertainty as to the behavioral response of fish to elevated levels of underwater sound produced when driving piles in or near water.

2. <u>Pile Driving at the Ten Mile River Bridge Replacement Project</u>

a. Physical Injury Effects of Pile Installation

At the Ten Mile River Bridge project, Caltrans has incorporated several measures into project to attenuate high levels of underwater sound during pile driving. Instead of using an impact hammer, a vibratory hammer will be used to install the sheet piles for the cofferdams around the piers of the new and existing bridge. Based on similar work conducted at the Port of Oakland, use of a vibratory hammer should reduce peak underwater sound pressure levels by approximately 28 decibels when compared to an

impact hammer. A reduction from 205 to 177 dB_{peak} at 10 m was observed with the use of a vibratory hammer at the Port of Oakland (Anderson and Reyff 2006).

For the project's permanent piles, a dewatered cofferdam will be used to create an air space around the 30-inch diameter pile. The air space should attenuate underwater sound pressure levels in the surrounding estuary. Based on previous monitoring studies using similar sized piles and attenuation systems (Reyff 2003, Reyff and Rodkin 2004), Caltrans anticipates that peak underwater sound pressure levels of 190 dB will occur at a distance of 10 m from the in-river permanent piles being installed. Dewatered isolation casings will be used in order to attenuate underwater sound during the installation of the in-river temporary piles used in the trestle and falsework construction. Similar to the in-river permanent piles, Caltrans anticipates that peak underwater sound pressure levels of 190 dB will occur at a distance of 10 m from the in-river temporary piles being installed. Data collected from previous monitoring studies at pile driving construction sites reveal a strong relationship between peak pressure and SEL, with an average 25 dB difference between the two metrics. Based on this correlation, the 190 dB_{peak} level predicted by Caltrans at this project is equivalent to 165 dB_{SEL}. Therefore, 25 dB was subtracted from the estimated 190 dB_{peak} to obtain a single strike SEL estimate of 165 dB for piles installed at the Ten Mile River Bridge Replacement Project.

The installation of the sheet piles for the cofferdams and the in-river temporary piles for the trestle and falsework is proposed to occur from June 15, 2007, through October 31, 2007, from September 15, 2008, through October 31, 2008, and from September 15, 2009, through October 31, 2009. Caltrans estimates that it will take approximately 900 strikes with an impact hammer to install each in-river temporary pile. The installation of the land-based permanent and temporary piles is proposed to occur year-round. Caltrans estimates that it will take approximately 1,000 strikes with an impact hammer to install each land-based permanent and temporary pile.

The installation of the 128 in- or near-river permanent piles may occur year-round for the duration of the three year project. Caltrans estimates that it will take approximately 1,000 strikes with an impact hammer to install each of these piles, and 128,000 hammer strikes to install all of them. A total of 15,000 hammer strikes may occur on any given day, given the daily maximum of 15 piles that can be installed. Because a specific schedule has yet to be set for pile driving, this analysis assumes that the piles could all be driven during peak outmigration of salmonid smolts from March 1 through June 15 during 2007 and 2009. This is a worse-case scenario, because it is likely that Caltrans' contractor will perform some or most of the permanent pile installation during the summer, fall and early winter months.

Salmonid smolts in the Ten Mile River estuary may remain in proximity of the construction site throughout any given day, as these fish tend to migrate at night (Groot and Margolis 1991). However, salmonid smolt movement in an estuarine environment is also dependant on tidal currents and this will also influence the duration of exposure to construction at the Ten Mile River Bridge site. Tytler *et al.* (1978) and McCleave (1978) report that Atlantic salmon smolts utilize the ebb tide currents in estuaries to assist their

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downstream migration to the ocean. Gibson (1992) in a review of tidally-synchronized behavior of marine fishes reports fishes in estuaries synchronize their behavior with the tides either to achieve transport or to prevent displacement.

The estimated single strike underwater sound exposure level for both in-river permanent and temporary piles at the Ten Mile River Bridge Replacement Project is 165 dB_{SEL} at 10 meters from the pile being installed. This sound level is well below the single strike criterion of 187/190 dB_{SEL} that is considered the threshold for physical injury to juvenile/adult listed salmonids. With the use of the single strike criterion of 187 dB_{SEL} presented by Popper et al. (2006), there should be no listed salmonids physically injured as a result of exposure to the underwater sound pressure produced during a single pile driving strike. However, this single strike criterion does not take into account potential exposure to thousands of strikes that are proposed to occur during a single work day. As discussed during the May 25, 2006, telephone conference call between FHWA, Caltrans, NMFS, and Dr. Popper, there is general agreement that accumulation of energy must be considered to determine the potential effects of elevated levels of underwater sound on fish. However, currently there are no empirical data upon which to base such an analysis and establish a criterion. Therefore, there is uncertainty regarding the potential for physical injury of listed salmonids exposed to multiple strikes, but there is not currently a method by which the level of impact can be quantified.

b. Hearing and Behavior Effects of Pile Installation

Based on the best available information (presented in the literature review above), salmonids exposed to a single exposure of up to 190 dB_{peak} at 10 m during pile driving are not anticipated to suffer permanent hearing damage. However, there is much uncertainty regarding how these fish will respond behaviorally if exposed to elevated levels of underwater sound produced during thousands of strikes. Exposure to pile driving sound is anticipated to occur periodically during the two-three year period of construction

The proposed work period for the installation of in-river temporary piles will avoid the migration seasons of adult and juvenile salmonids. Therefore, no adverse behavioral effects due to installation of the temporary piles are anticipated on migrating fish. However, permanent piles may be installed during the migration season and rearing juvenile fish in the estuary will be exposed to elevated sound levels from both the installation of temporary and permanent piles. The potential effects of pile driving on rearing juvenile salmonids are presented below.

During installation of the permanent piles, migrating adult and juvenile salmonids may respond by avoiding the area where elevated underwater sound pressure levels are perceived. This could delay or detour the migration of individual fish until pile driving stops. These delays or detours are not expected to exceed the 8-10 hour period of a single construction work day and may only extend 20 minutes during the installation of a single pile. Fish are expect to resume migration between pile driving episodes or overnight between construction days.

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An increase in predation may occur during delays or detours to migration. The mouth of the Ten Mile River is only 488 meters from the construction site of the new bridge. If sound levels result in delays or detours, an increase in predation rates by marine mammals at the river mouth and in the estuary could result. Harbors seals (*Phoca vitulina)* and California sea loins (*Zalophus californianus*) are known to congregate at the mouths of rivers to feed on salmonids.

A small number of juvenile steelhead and coho salmon may reside in the estuary over the summer and fall months. These fish will not be actively migrating, but foraging and rearing prior to outmigration as smolts in the spring. Most juvenile salmonids in the estuary are expected to inhabit areas upstream of the bridge construction site where fresher water is available. There are no abundance estimates available to determine how many juvenile steelhead or coho salmon may be in the project area, but it is likely most rearing juvenile salmonids will prefer the fresher water areas of the estuary upstream of the project and will not be subject to elevated levels of underwater sound during pile driving.

Although few in number, during the three year duration of project construction some juvenile salmonids rearing in the Ten Mile River estuary are likely to be adversely effected by pile driving activities. If juvenile salmonids response by exiting the area of elevated sound, fish may abandon their daytime shelter or foraging location. This may result in reduce foraging rates and subsequently growth. In addition, displaced fish could be more vulnerable to avian and piscivorous predation. Daily pile driving and the resulting elevated sound levels may deprive rearing fish from effected habitat areas in the estuary. The extent of this habitat deprivation is unknown, but could extend the full width of the estuary at the project site (approximately 150 meters) and up to 500 meters upstream and downstream of the site. Fish will detect sound levels above 150 dB_{rms} which is expected to extend 500 meters from the project site.

The use of a vibratory hammer to install sheet piles will result in underwater sound pressure levels that are not anticipated to cause physical injury to either adult or juvenile listed salmonids, although a behavioral response is likely as the lower frequencies produced during the installation of sheet piles are more likely to elicit a behavioral response.

There are three bents that are located on land at distances of 53.5, 74.5, and 85 meters from the river. No estimate has been provided to NMFS regarding the underwater sound pressure level that may occur during the proposed year-round installation of the 104 permanent piles used during their construction. Caltrans has stated that monitoring of underwater sound produced during installation of land-based permanent piles at these three bents will not be conducted. Although NMFS will assume that sound transmitted through the soil to the estuary during installation of these piles will not reach levels that would cause physical injury to listed salmonids (Batelle 2004), sound levels that elicit a behavioral response may occur the estuary adjacent to the project site.

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Likewise, there has been no estimate provided to NMFS regarding the underwater sound pressure level that may occur during the installation of the 277 land-based temporary piles used to construct the trestle and falsework. Similar to the land-based permanent piles, Caltrans has stated that monitoring of underwater sound produced during installation of the land-based temporary piles will not be conducted. Although NMFS will assume that sound transmitted through the soil to the estuary during installation of these piles will not reach levels that would cause physical injury to listed salmonids (Batelle 2004), sound levels that elicit a behavioral response may occur in the estuary adjacent to the project site

3. Effects of Dewatering Cofferdams and Fish Relocation

The timing of the cofferdam construction and dewatering will greatly influence the potential impact of this activity, because the abundance of juvenile salmon and steelhead in the Ten Mile River estuary varies with season. If cofferdams are constructed and dewatered during the late winter or spring, the likelihood of juvenile Chinook salmon, coho salmon, and steelhead will be higher. If cofferdam construction is conducted during the late summer and early fall, the potential for Chinook salmon and coho salmon juvenile presence will be very low, with the probability of juvenile steelhead presence relatively higher. If juvenile steelhead are present during this time, their numbers are expected to be low at the construction site.

A total of eight cofferdams are proposed, three for the construction of the new bridge, and five for the demolition of the old bridge. Sheet pile driving is expected to elicit a startle respond from fish and they will likely exit the site. Therefore, cofferdam construction is expected to result in low numbers of fish being entrapped inside the cofferdams. Once the cofferdams are completed, Caltrans proposes to reduce the water level inside cofferdams with screened pumps to facilitate fish relocation activities.

Juvenile steelhead and to a lesser extent juvenile salmon are expected to be adversely impacted by the electrofishing during the efforts to remove fish from the cofferdam enclosures. The percent mortality expected from the fish relocation activities is expected to be small. Studies have indicated that electrofishing can result in mortality of 6 - 20 percent Habera *et al.* (1996). However, based on recent experience with up-to-date equipment and techniques, unintentional mortality of listed juvenile salmonids is expected is expected to be lower than the rates reported above by Habera *et al* (1996). Mortality from capture and handling procedures is not expected to exceed three percent of the fish subjected to handling, and can be reduced to near one percent with increased skill and experience of the operator. Due to the very low densities of Chinook and coho salmon, expected mortalities of these salmon juveniles would be expected to be minimal, but mortality could occur. Juvenile salmonids, mostly steelhead, in low numbers (<20 fish) are expected to be present within cofferdams when relocation occurs.

To minimize impacts to fish in dewatered areas, Caltrans proposes to seine cofferdams first and then conduct electrofishing. Caltrans proposes that only qualified biologists, to conduct the fish relocation to suitable habitats outside of the construction area to

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minimize the take of listed salmonids. Despite the potential impacts of fish relocation operations, this activity is expected to significantly reduce the number of juvenile steelhead, coho salmon, and Chinook salmon that would otherwise be injured or killed during the construction of the cofferdams.

B. Impacts to Habitat

1. Turbidity

Aquatic habitat for listed anadromous salmonids, including designated critical habitat for CC Chinook salmon, CCC coho salmon, and NC steelhead will likely be subject to increased levels of turbidity during construction of the new bridge's substructure and during the demolition of the existing bridge. Driving of sheet piles for the cofferdam into the substrate of the estuary, as well as dewatering within the eight cofferdams, is expected to suspend fine sediment into the water column. The trestle and falsework piles will be driven in double-walled isolated casings, or similar structures, which is expected to minimize turbidity when the temporary piles are driven.

The project proposes to drill out and remove 4,000 cubic yards of material for the construction of the new piers. Once removed, this material will be transported to an offsite disposal location. The removal and transport of this material from the estuary creates some potential for delivery to aquatic habitat. The potential for delivery and associated adverse impacts will be low due to implementation of BMPs included in the SWPPP. Therefore, turbidity from bridge construction, demolition, cofferdam construction and dewatering, and sediment removal and disposal, is expected to be small, localized, and unlikely to adversely affect listed salmonids

2. Riparian Vegetation Removal

Approximately 0.4 acres of wetland and riparian habitat will be temporarily impacted by the construction of the new bridge. If successful, the proposed restoration of riparian habitat following demolition of the old bridge should compensate for the riparian habitat lost due to the construction of the new bridge.

3. Temporary and Permanent Effects to Salmonid Habitat

Pier construction and pier removal is expected to have impacts on available salmonid habitat, including eelgrass areas in the Ten Mile River estuary. FHWA (2004), estimates that a total of 5,411.7 square meters of salmonid habitat will be temporarily impacted by the trestles, falsework, and attenuation system. The columns for the new bridge will be smaller than the existing bridge and will result in a net gain in habitat available for aquatic species. The existing bridge columns will be removed (250.8 square feet), and will be replaced by the new columns (164.7 square feet), for a net gain of 86 square feet of habitat.

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Caltrans proposes to mitigate for the losses of eelgrass based on their April 7, 2006, Ten Mile River Bridge Seismic Retrofit Project, Eelgrass Mitigation and Monitoring Plan. The mitigation and monitoring plan proposes to conduct pre-project surveys of eelgrass, and post-project surveys to determine the need to replant eelgrass. If required, Caltrans will replant eelgrass, monitor the success of their mitigation efforts, and report this information to resource agencies.

The temporary loss of aquatic habitat is not expected to decrease salmonid distribution or abundance in the estuary due to the relatively small area that will be impacted. The Ten Mile River estuary is 3.2 miles long and is expected to provide sufficient habitat for salmonid migration and rearing during the three years that the bridge is under construction. Post construction mitigation of eelgrass is expected to minimize long term effects to salmonid habitat associated with the project.

4. Proposed Coho Salmon Mitigation

Caltrans is proposing to mitigate for take of State listed endangered CCC coho salmon to meet the requirement to fully mitigate for any take of a State listed species. A project to enhance fish passage will occur at one of three locations recommended by the CDFG. This fish passage project will be designed and permitted at a later date (L. Embree 2006).

Insufficient information is currently available to analyze the potential effects of this mitigation action (*i.e.* fish passage project) in this biological opinion. It is anticipated that the effects of this project will be analyzed in a future section 7 consultation and any resulting incidental take of listed salmonids associated with construction or operation of the fish passage structure will be addressed at that time. This biological opinion does not include the potential effects or incidental take associated with this California Endangered Species Act coho salmon mitigation action.

C. Interdependent and Interrelated Actions

NMFS does not anticipate any interdependent or interrelated actions associated with the proposed action.

VI. CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

NMFS is not aware of any cumulative effects that are likely to occur in the action area, other than on-going actions described above in the "Environmental Baseline" section.

VII. INTEGRATION AND SYNTHESIS OF EFFECTS

A. Pile Driving Activities

NMFS anticipates that no physical injuries will occur to listed salmonids as a result of their exposure to underwater sound produced during a single hammer strike. However, there is uncertainty as to the level of impact which might occur during exposure to underwater sound produced from multiple hammer strikes. Accumulation of energy must be considered to determine the potential effects of elevated levels of underwater sound on fish, but there currently is no empirical data upon which to base such an analysis and establish a criterion. Therefore, there is uncertainty regarding the potential for physical injury of listed salmonids exposed to multiple strikes, but there is not currently a method by which the level of impact can be quantified.

Behavioral effects on adult and juvenile salmonids are expected due to pile driving. Outmigrating salmonid smolts will be subjected to harassment during pile driving activities between March 1 and June 15. Adult salmonids will be subject to harassment between the period from November through December for adult Chinook salmon, from November through January for adult coho salmon, and December through June 15 for adult steelhead. The level of harassment will depend on the sound level that an individual fish is exposed.

The installation of in-river temporary piles during the summer and late fall months may adversely affect low numbers of juvenile steelhead and coho salmon that are rearing in the Ten Mile River estuary. Similar to the smolts migrating in the spring, the effect will depend on the level and duration of underwater sound to which they are exposed. Adult salmonids are not expected to be present during the installation of temporary piles, and therefore will not be affected.

Rearing juvenile salmonids are likely to response to pile driving activities by exiting the area of elevated sound. Fish may abandon their daytime shelter or foraging location. This may result in reduce foraging rates and subsequently growth. Displaced fish could be more vulnerable to predation. Daily pile driving and the resulting elevated sound levels may deprive rearing fish from effected habitat areas in the estuary. The extent of this habitat deprivation is unknown, but could extend the full width of the estuary at the project site and up to 500 meters upstream and downstream of the site.

B. Dewatering and Fish Relocation

During dewatering of the estuary cofferdam sites and fish relocation efforts will take place. The potential does exist for juvenile salmonid mortality to occur during this phase of the project. A very low probability of juvenile Chinook and coho salmon occurrence at the site exists, subjecting juvenile salmon to the effects of the relocation activities. The potential for steelhead presence during dewatering is greater than salmon. Qualified fishery biologists will take appropriate precautions during fish relocation activities to minimize adverse effects to juvenile steelhead and salmon, which are captured during relocation efforts. Low numbers of juvenile steelhead and few juvenile salmon are expected to be present during the dewatering and relocation phase of the project.

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Relocation activities associated with dewatering of construction areas is not expected to affect steelhead or salmon populations, distribution or reproductive success within the Ten Mile River. Very few steelhead, and few if any juvenile salmon are known to rear in project area during the period of the proposed cofferdam installation. In addition, the majority of the individual steelhead and salmon that are captured and relocated are expected to continue their normal life history pattern.

C. Mobilization of Sediment

Potential for mobilization of fine sediment delivery to the estuary exists from the disturbance of construction activities such as dewatering cofferdams, removing vegetation, road construction, staging areas, bridge construction, and temporary roads. Caltrans proposed BMPs and SWPPP are anticipated to reduce the mobilization of the majority of potential fine sediment from the project actions. Based the proposed project description the likelihood for delivery of sediment from the construction site will be minimized by measures implemented with the BMPs and SWPPP. Turbidity levels are not expected to reach thresholds that will adversely affect salmonid life stages, including adult migration or juvenile rearing survival.

D. Effects to NC steelhead DPS and Critical Habitat

Pile driving activities occurring during the spring and summer months are expected to adversely affect juvenile steelhead and reduce habitat availability. This effect is not expected to increase the extinction risk for NC steelhead in the Ten Mile River watershed. This conclusion is based in part because steelhead are distributed throughout the Ten Mile River watershed. Although smolt production has decreased in recent years, the Ten Mile population appears to be at levels (based on Maahs 1997) that can absorb the relatively small losses expected from pile driving and other bridge replacement construction activities.

NC steelhead critical habitat will be adversely affected the early spring months through the late fall. Based on available information, low densities of juvenile steelhead utilize the estuary during the summer and fall. Critical habitat affected by the bridge construction actions (pile driving and construction) will reduce the available rearing habitat in the summer and through fall of 2007, 2008, 2009. Spring time steelhead smolt migration and rearing habitat may be affected. The adverse effects to steelhead critical habitat will short term, and habitat function is expected to return once the project in completed. Therefore, the adverse effects to designated critical habitat for NC steelhead are not anticipated to reach a level, with the proposed minimization and avoidance measures, to diminish the value of critical habitat for the conservation of NC steelhead.

E. Effects to CC Chinook ESU and Critical Habitat

Available information on the Ten Mile River Chinook salmon population is limited, but indicates low numbers of Chinook salmon continue to utilize the Ten Mile River

watershed. Chinook salmon are known to utilize the Ten Mile River estuary in the spring months. Critical habitat will be affected by construction. If adult and juvenile fish avoid areas of elevated sound, amount of suitable estuarine habitat in Ten Mile River will be reduced during construction of this project, but will be functional during the night and other times when no pile driving is occurring. Critical habitat is expected to function as short-term rearing habitat during smolt outmigration when pile driving is not occurring and return to pre-project quality once construction is completed, the revegetation plan is implemented, and eelgrass mitigation work is completed. Therefore, NMFS concludes that the short term adverse effects to critical habitat, and minimization and avoidance measures, will not diminish the value of critical habitat for the conservation of CC Chinook salmon.

F. Effects to CCC Coho Salmon ESU and Critical Habitat

As with the two anadromous salmonid species discussed above, pile driving activities occurring during the spring and summer months are expected to adversely affect juvenile steelhead and reduce habitat availability. Potential impacts to any coho smolts in the Ten Mile River watershed is cause for concern, due to their low numbers in the watershed and the small size and patchy distribution of the remaining population in the Ten Mile River and in other watersheds inhabited by the CCC coho salmon ESU. However, because the behavior impacts associated with driving the permanent pile will: 1) occur during only one year of smolt migration in the Ten Mile River, 2) affect only the medium strength brood year of coho salmon in the Ten Mile River, and 3) result in a relatively small rate of indirect injury or death, these impacts are not expected to increase the extinction risk for endangered CCC coho salmon in the Ten Mile River watershed.

The adverse effects to coho salmon critical habitat will short term, and full habitat function is expected to return once the project is completed. Pile driving may deprive rearing fish from portions of the estuary due to elevated sound levels, but few, if any, juvenile coho salmon utilize the Ten Mile River estuary as rearing habitat during the summer and late fall (S. Harris, pers. comm. 2006). Therefore, the adverse effects to designated critical habitat for CCC coho salmon is not anticipated to reach a level, with the proposed minimization and avoidance measures, to diminish the value of critical habitat for the conservation of CCC coho salmon.

VIII. CONCLUSION

After reviewing the best available scientific and commercial information, the current status of the species and critical habitat, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is NMFS' biological opinion that the construction of the Ten Mile Bridge Replacement Project by FHWA and Caltrans, in Mendocino County, California is not likely to jeopardize the continued existence of CCC coho salmon, CC Chinook salmon, or NC steelhead .

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proposed action, and the cumulative effects, it is NMFS' biological opinion that the construction of the Ten Mile Bridge Replacement Project by FHWA and Caltrans, in Mendocino County, California is not likely to destroy or adversely modify designated critical habitat designated for CCC coho salmon, CC Chinook salmon or NC steelhead.

IX. INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulation pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by NMFS as an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not the purpose of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are nondiscretionary, and must be undertaken by the FHWA, Caltrans, and their designees for the exemption in section 7(o)(2) to apply. The FHWA and Caltrans have a continuing duty to regulate the activity covered by this incidental take statement. If the FHWA and Caltrans: (1) fail to assume and implement the terms and conditions, or (2) fail to require any designee to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to any permit, grant document, or contract, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the FHWA and Caltrans must report the progress of the action and its impact on the species to NMFS as specified in the incidental take statement (50 CFR §402.14(i)(3)).

A. Amount or Extent of Take

Incidental take of adult and juvenile threatened CC Chinook salmon, endangered CCC coho salmon and threatened NC steelhead is expected during construction of this project due to cofferdam construction and pile driving. Upon completion of the eight cofferdams, take is expected to occur due to dewatering of the cofferdams and subsequent fish relocation efforts. The majority of this take will be non-lethal take. Some injury and mortality of juvenile salmonids is anticipated as fish are collected by seining, electrofishing and other relocation related activities. It is anticipated that most fish will exit the construct site prior to closure of the cofferdam. Therefore, it is estimated that less than 160 juvenile salmonids will remain to be collected in all eight cofferdams combined and relocated from the enclosures. Up to three percent of the collected and relocated fish could be injured or killed as a result of handling.

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Pile driving and associated sound pressure waves from this activity is expected to cause non-lethal take (displacement) of listed Chinook salmon, coho salmon, and steelhead smolts in the Ten Mile River estuary as they migrate through the project area. This Non-lethal take of salmonid smolts expected from the installation of in-river permanent piles is expected to occur during the spring outmigration seasons in 2008 and, possibly, 2009. Adult listed salmonids may be behaviorally affected during the fall, winter and spring upstream migration season. Adult and juvenile migrating fish may be delayed or detour the action area until pile driving stops. These delays or detours are not expected to exceed the 8-10 hour period of a single construction work day and may only extend 20 minutes during the installation of a single pile. An increase in predation may occur during delays or detours to migration.

In the summer and fall, pile driving during the installation of in-water temporary and land-based temporary and permanent piles is expected to harass juvenile steelhead rearing in the Ten Mile River estuary. Juvenile steelhead numbers are expected to be low in the action area during the summer, but some use of the estuary is anticipated. Very few juvenile coho are anticipated to rear in the action area during the summer and fall months. Rearing juvenile steelhead and coho are likely to response to pile driving activities by exiting the area of elevated sound. Fish may abandon their daytime shelter or foraging location. This may result in reduce foraging rates and subsequently growth. Displaced fish could be more vulnerable to predation. Daily pile driving and the resulting elevated sound levels may deprive rearing fish from effected habitat areas in the estuary during construction. The extent of this habitat deprivation is unknown, but could extend the full width of the estuary at the project site and up to 500 meters upstream and downstream of the site.

B. Effect of the Take

In the accompanying opinion, NMFS determined that this level of anticipated take is not likely to result in jeopardy to the species.

C. Reasonable and Prudent Measures

The following reasonable and prudent measures are necessary and appropriate to minimize the impacts of the incidental take of NC steelhead, CC Chinook salmon, and CCC coho salmon:

1. Measures shall be taken to minimize adverse effects to listed salmonids from fish relocation activities.

2. Measure shall be taken to minimize adverse effects to listed salmonids from bridge and roadway construction.

3. Measures shall be taken to minimize adverse impacts to stream water quality.

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4. Measures shall be taken to minimize adverse effects to listed salmonids during pile driving activities.

5. Measures shall be taken to monitor the anticipated take of listed salmonids.

D. Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the FHWA, Caltrans, and their designee(s) must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

<u>The following terms and conditions implement Reasonable and Prudent Measure 1, to minimize adverse effects to listed salmonids from fish relocation activities</u>.

1. FHWA and Caltrans shall provide NMFS with a "Dewatering and Fish Relocation Plan" for review 30 days prior to the start of dewatering and fish relocation activities. This plan shall outline cofferdam construction, dewatering, and fish relocation methods. The plan shall be submitted to NMFS Santa Rosa Area Office (see address below).

2. FHWA and Caltrans shall retain a qualified biologist with expertise in the areas of anadromous salmonid biology, including handling, collecting, and relocating salmonids; salmonid/habitat relationships; and biological monitoring of salmonids. FHWA and Caltrans shall ensure that all biologists working on this project be qualified to conduct fish collections in a manner which minimizes potential risks to listed salmonids. Electrofishing, if used, shall be performed by a qualified biologist and conducted according to the "NOAA Fisheries Guidelines for Electrofishing Waters Containing Salmonids Listed Under the Endangered Species Act", June 2000.

3. The biologist shall monitor the construction site during placement and removal of cofferdams to ensure that any adverse effects to salmonids are minimized. The biologist shall be on site during all dewatering events to ensure that all listed salmonids are captured, handled, and relocated safely. The biologist shall notify NMFS biologist Thomas Daugherty at (707) 468-4057 or tom.daugherty@noaa.gov one week prior to relocation activities in order to provide an opportunity for NMFS staff to observe the activities.

4. Listed salmonids shall be handled with extreme care and kept in water to the maximum extent possible during relocation activities. All captured fish shall be kept in cool, shaded, aerated water protected from excessive noise, jostling, or overcrowding any time they are not in the stream and fish shall not be removed from this water except when released. To avoid predation the biologist shall have at least two containers and segregate young-of-year salmonids from older salmonids and other potential aquatic predators. Captured salmonids shall be relocated, as soon as possible, to an area of the Ten Mile River estuary which has suitable habitat conditions, which allows for survival of the transported salmonids.

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5. Pumps used to dewater the work area shall be equipped with screens that meet the following NMFS fish screening criteria:

a. Perforated plate: screen openings shall not exceed 3/32 inches (2.38mm), measured in diameter.
b. Woven Wire: screen openings shall not exceed 3/32 inches (2.38 mm measured diagonally).
c. Screen material shall provide a minimum of 27% open area.
d. Approach velocity shall not exceed 0.33 feet per second.

<u>The following terms and conditions implement Reasonable and Prudent Measure 2, to minimize adverse effects to listed salmonids from bridge and roadway construction.</u>

6. FHWA or Caltrans shall provide written notification to NMFS at least fourteen days prior to commencement of in-channel bridge construction. Written notification shall be sent to the NMFS Santa Rosa Area Office (see address below).

7. FHWA, Caltrans, or contractor shall allow any NMFS employee(s) or any other person(s) designated by NMFS, to accompany field personnel to visit the construction sites during project construction. NMFS will notify Caltrans Resident Engineer 48 hours prior to planned site visits and will contact Caltrans personnel prior to entering the construction site.

8. FHWA or Caltrans shall invite NMFS and CDFG to attend a scheduled pre-construction meeting prior to the construction season for in-channel work. This meeting shall occur prior to the June 15 start date for in-channel work.

<u>The following terms and conditions implement Reasonable and Prudent Measure 3, to minimize adverse impacts to stream water quality.</u>

9. Contractors must have a supply of erosion control materials onsite to facilitate a quick response to unanticipated storm events or emergencies.

10. Concrete or drilling muds (*i.e.* Bentonite) shall be prevented from entering the stream channel.

11. Water that comes in contact with wet concrete and has a pH greater than 9.0 must not be allowed to enter the ground or stream. All waters directly discharged to the Ten Mile River shall be consistent with the Construction Dewatering Permit issued to Caltrans by the North Coast Regional Water Quality Control Board. The Construction Dewatering Permit's monitoring and reporting compliance reports shall be transmitted to the NMFS (see address below).

12. Construction equipment used within the creek channel will be checked each day prior to work within the creek channel (top of bank to top of bank) and if necessary

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action will be taken to prevent fluid leaks. If leaks occur during work in the channel (top of bank to top of bank), FHWA, Caltrans, or their contractor will contain the spill and remove the affected soils.

13. Water for dust abatement, if necessary, must be acquired from an off-site source and not within an area that has salmonids present. Water drafting from the action area is not permitted.

14. Working waters from the project area shall only be discharged to the live stream, in a manner fully consistent with the Construction Dewatering Permit issued to Caltrans by the North Coast Regional Water Quality Control Board.

15. Caltrans shall monitor in-channel activities and performance of sediment control or detention devices for the purpose of identifying and reconciling any condition that could adversely affect salmonids or their habitat.

16. FHWA and Caltrans shall provide NMFS with a copy of the project's Storm Water Pollution Prevention Plan (SWPPP), which specifies Best Management Practices (BMPs) to control mobilization of sediment from the project. If BMPs must be modified, repaired or when additional BMPs are implemented, the SWPPP will be updated to reflect needed changes. When updates to the SWPPP occur, Caltrans shall notify NMFS of these changes, and submit an updated version of the SWPPP to NMFS prior to May 1 of each construction season, excluding the first construction season. Documents shall be submitted to NMFS Santa Rosa Area Office (see address below).

17. All erosion control BMPs shall be in place by October 31 of each construction season. FHWA and Caltrans shall invite NMFS to attend a construction site tour to view the BMPs during the month of November, where NMFS can make recommendations for additional BMPs to minimize impacts to water quality.

18. Construction work conducted between October 15 and June 15 shall not create conditions that mobilize sediment or concentrate over-land flow from construction areas into the stream-channel network.

<u>The following terms and conditions implement Reasonable and Prudent Measure 4, to minimize adverse effects to listed salmonids during pile driving activities.</u>

19. FHWA and Caltrans shall monitor underwater sound during pile driving activities. If underwater sound produced during five or more strikes on a single day exceeds the anticipated level of 190 dB_{peak} at 10 meters from the pile being installed, then NMFS must be contacted within 24 hours: David Woodbury (707) 575-6088 or David.P.Woodbury@noaa.gov, or the NMFS Santa Rosa Office (707) 575-6050.

20. FHWA and Caltrans shall provide quarterly reports to NMFS with the results of the hydroacoustic monitoring program. The first report shall be submitted to NMFS no later

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than October 31, 2007, and shall provide results for the period of June 15 through September 30, 2007. Subsequent quarterly reports shall be provided no later than January 31 (for the period October through December), April 30 (for the period January through March), July 31 (for the period April through June) and October 31 (for the period July through September) until pile driving activities are completed. Reports shall be submitted to NMFS Santa Rosa Area Office (see address below).

21. FHWA and Caltrans shall prepare a monitoring plan to assess the behavioral effects of pile driving at the Ten Mile River Bridge Replacement Project on rearing and migrating juvenile salmonids. The monitoring plan shall be designed to evaluate the displacement of fish from areas subjected to elevated sound levels, piscivorous and avian predation, delays/detours to migration, and other potential effects associated with elevated sound levels. Monitoring program shall be performed for a minimum of 10 days of pile driving in the summer of 2007 and 2008 and for a minimum of 10 days of pile driving in the spring outmigration season in 2008 and 2009. The draft monitoring plan shall be submitted to NMFS Santa Rosa Area Office for review and approval prior to December 31, 2006 (see address below).

<u>The following terms and conditions implement Reasonable and Prudent Measure 5 to monitor the anticipated take of listed salmonids.</u>

22. FHWA and Caltrans shall provide NMFS with an annual summary report within 90 days of the completion of fish relocation activities each year. The report shall include the methods used during the fish relocation efforts, location, number and species captured, number of mortalities by species, and other pertinent information related to the fish relocation activities. Reports shall be submitted to NMFS Santa Rosa Area Office (see address below).

23. FHWA, Caltrans or contractor shall allow any NMFS employee(s) or any other person(s) designated by NMFS, to access Ten Mile River Bridge Replacement Project areas during the construction period for the purpose of observing construction activities, evaluating fish and stream conditions, monitoring performance with Caltrans BMPs, monitoring water quality, collecting fish samples, or perform other monitoring/studies. NMFS will notify Caltrans Resident Engineer 48 hours prior to planned site visits and will contact Caltrans personnel prior to entering the construction site.

24. All reports or plans required for the above terms and conditions shall be sent to:

NMFS Santa Rosa Area Office
Supervisor, Protected Resources Division
Southwest Region
National Marine Fisheries Service
777 Sonoma Avenue, Room 325
Santa Rosa, California 95404

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X. CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, or to develop information.

1. The installation of permanent steel piles with impact hammers should not occur between March 1 and June 15 to avoid adverse impacts to migrating juvenile listed salmonids.

2. FHWA in coordination with the NMFS should initiate studies to acquire empirical data for establishing criteria for the cumulative effects to fish from exposure to underwater sound produced during multiple pile driving strikes.

3. FHWA should apply dual-frequency identification imaging sonar technology to measure, as feasible, the distribution, movement, and behavioral response of listed salmonids when sound pressures are generated during pile driving.[5]

4. FHWA should initiate a study to determine the distribution and abundance of juvenile listed salmonids inhabiting the Ten Mile River estuary during the summer months, as well as the density of juvenile listed salmonids during their migration through the estuary during the early-spring through early-summer months.

XI. REINITIATION NOTICE

This concludes formal consultation for the proposed FHWA and Caltrans Ten Mile Bridge Replacement Project in Mendocino County, California. As provided in 50 CFR §402.16, reinitiation of formal consultation is required if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered in this opinion; (3) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, formal consultation shall be reinitiated immediately.

XII. LITERATURE CITED

[5] In a meeting on April 27, 2006, FHWA agreed to test the feasibility of using this technology, or an equivalent tool of higher resolution, during the construction of this project and evaluate this technology as a research tool for assessing fish distribution, movement, and behavioral response to underwater sound produced during pile driving.

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Enclosure 2

TEN MILE RIVER BRIDGE REPLACEMENT PROJECT

ESSENTIAL FISH HABITAT CONSERVATION RECOMMENDATIONS (Magnuson-Stevens Fishery Conservation and Management Act EFH Consultation)

The 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) set forth new mandates for the National Marine Fisheries Service (NMFS), regional fishery management councils, and Federal action agencies to identify and protect important marine and anadromous fish habitat. The Councils, with assistance from NMFS, are required to delineate essential fish habitat (EFH) in fishery management plans (FMPs) or FMP amendments for all managed species. Federal action agencies, which fund, permit, or carry out activities that may adversely impact EFH are required to consult with NMFS regarding potential adverse effects of their actions on EFH, and respond in writing to NMFS conservation recommendations. In addition, NMFS is required to comment on any state agency activities that would impact EFH. Although the concept of EFH is similar to that of Critical Habitat under the Endangered Species Act, measures recommended to protect EFH are advisory, not proscriptive. The Pacific Fisheries Management Council has delineated EFH for Pacific Coast Salmon (PFMC 1999).

I. IDENTIFICATION OF ESSENTIAL FISH HABITAT

Essential fish habitat (EFH) is defined in the MSFCMA as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. NMFS regulations further define waters to include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate to include sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary to mean the habitat required to support a sustainable fishery and the managed species contribution to a healthy ecosystem; and spawning, breeding, feeding, or growth to maturity to cover a species full life cycle.

For Pacific coast salmon, the geographic extent of EFH currently being considered includes both marine and freshwater habitat. For purposes of this consultation, Pacific coast salmon EFH corresponds closely to Critical Habitat designated under the Endangered Species Act (ESA) for Central California Coast coho salmon (64 FR 24049) and Critical Habitat designated under the ESA for California Coastal Chinook salmon (70 FR 52488).

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II. PROPOSED ACTION

The proposed action for threatened California Coastal Chinook salmon, Central California Coast coho salmon, Northern California steelhead, and critical habitat designated for these species is described in the preceding biological opinion.

III. EFFECTS OF THE PROJECT ACTION

The associated biological opinion has a general description of the non-fishing related activities that directly or cumulatively, temporarily or permanently may threaten the physical, chemical and biological properties of the habitat utilized by Pacific coast salmon and their prey within the proposed project area. The direct result of these threats is that the function of EFH may be eliminated, diminished or disrupted.

Potential impacts to Pacific coast salmon EFH specifically EFH designated for Central California Coast coho salmon and California Coastal Chinook salmon are described in the preceding biological opinion. Adverse effects of the proposed action on salmonids EFH may occur through dewatering and in-channel construction activities, riparian vegetation removal, and associated freeway construction work within the Ten Mile River estuary.

IV. CONCLUSION

Upon review of the anticipated effects, NMFS believes that proposed freeway construction actions are likely to cause adverse effects to Pacific coast salmon EFH.

V. EFH CONSERVATION RECOMMENDATIONS

Pursuant to Section 305(b)(4)(A) of the Magnuson-Stevens Act, NMFS recommends that the terms and conditions 6 through 18 of the preceding biological opinion's Incidental Take Statement be adopted as EFH Conservation Recommendations for Pacific coast salmon habitat.

VI. FEDERAL AGENCY STATUTORY REQUIREMENTS

The Magnuson-Stevens Act (Section 305(b)(4)(B)) and Federal regulations (50 CFR Section 600.920(j)) to implement the EFH provisions of the MSFCMA require Federal action agencies to provide a written response to EFH Conservation Recommendations

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within 30 days of its receipt. The Federal action agency included in this consultation is the U.S. Army Corps of Engineers. A preliminary response is acceptable if final action cannot be completed within 30 days. The final response must include a description of measures proposed to avoid, mitigate, or offset the adverse impacts of the activity on delineated EFH. If the response is inconsistent with our EFH Conservation Recommendations, it must provide an explanation of the reasons for not implementing them.

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United States Department of the Interior

FISH AND WILDLIFE SERVICE

Arcata Fish and Wildlife Office
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EXHIBIT NO. 10
APPLICATION NO.
1-06-022 – CALTRANS
CONDITION COMPLIANCE
USFWS BIOLOGICAL OPINION (1 of 40)

In Reply Refer To:
1-14-1999-184.5

RECEIVED
SEP 29 2006
CALIFORNIA
COASTAL COMMISSION

Gene K. Fong
Division Administrator
Federal Highway Administration
California Division
980 Ninth Street, Suite 400
Sacramento, CA 95814-2724

Subject: Formal Consultation on Proposed Replacement of the Tenmile River Bridge, State Route 1, Mendocino County, California

Dear Mr. Fong:

This letter responds to the Federal Highway Administration's (FHWA) written request, dated September 20, 2004, for formal consultation with the U.S. Fish and Wildlife Service (Service) on FHWA's proposed Tenmile River bridge replacement project, located between post miles 69.4 and 70.1 on State Route (SR) 1 in Mendocino County, California (project). The Arcata Fish and Wildlife Office (AFWO) received your request (EA 01-385700, Document # 50180) on September 23, 2004. In a subsequent correspondence dated April 26, 2006 (received May 1, 2006), you describe alterations to the project design and construction that were developed after the submission of the biological assessment dated September 2004. Those alterations are described in detail in an addendum enclosed with your correspondence. Through this letter, the Service transmits its Biological Opinion regarding the effects of the proposed project on the endangered tidewater goby (*Eucyclogobius newberryi)* (goby) in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act), and its implementing regulations (50 CFR §402). It also includes our concurrence with your determination of effects for the endangered Howell's spineflower (*Chorizanthe howellii*) (spineflower), the endangered Menzies' wallflower (*Erysimum menziesii*) (wallflower), the threatened western snowy plover *(Charadrius alexandrinus nivosus*) (plover), the endangered brown pelican (*Pelecanus occidentalis*) (pelican), the threatened marbled murrelet (*Brachyramphus marmoratus*) (murrelet) and the threatened northern spotted owl (*Strix occidentalis caurina*) (owl).

TAKE PRIDE® IN AMERICA

You determined that the proposed project may affect and is likely to adversely affect the goby, but will have no effect on the spineflower, the wallflower, the plover, the pelican, the murrelet or the owl. You requested formal consultation on the goby based on your determination.

You indicated in your correspondence that this action does not affect critical habitat designated for any listed species. Therefore, critical habitat will not be addressed further in this consultation.

This Biological Opinion is based on the biological assessment, dated September 2004, included with FHWA's letter of September 20, 2004, requesting formal consultation; revisions to the September 2004 biological assessment provided in your correspondence of April 26, 2006, and its enclosed addendum; telephone conversations and e-mail communications between Mr. Ray Bosch of the Arcata Fish and Wildlife Office and Ms. Lisa Embree and Mr. Tim Ash of the California Department of Transportation (Caltrans); and written comments provided by the Service to earlier drafts of the September 2004 biological assessment. This Biological Opinion is also based on information provided during two prior formal consultations on an earlier stage of this action related to geotechnical drilling, including two Caltrans letters of November 21, 2002; the June 2002 biological assessment; our September 2001 Biological Opinion; the May 2000 biological assessment; the April 10, 2001, and August 1, 2001, addenda to the 2000 biological assessment; the June 1999 Draft Environmental Assessment/Initial Study; supplemental information received from the California Department of Transportation (Caltrans) in letters dated April 17, 2001, and August 1, 2001; telephone conversations, e-mails, and meetings between Service staff (including Mr. Bosch, Mr. Gary Falxa and Mr. Jim Watkins) and Caltrans staff (Ms. Embree and Mr. Steven Hansen); field investigations; and other sources of information. A complete administrative record of this consultation is on file in our office.

Other Environmental Reviews

This consultation does not include other environmental reviews that may be required by Federal statute (50 C.F.R. § 402.06), including the National Environmental Policy Act (42 U.S.C. 4321 *et seq.*), the Fish and Wildlife Coordination Act (16 U.S.C. 661 *et seq.*), and the Clean Water Act (33 U.S.C. 1251 *et seq.*). We recommend that Caltrans continue to coordinate with the Service under these other statutes.

The focus of this consultation is on the actual construction and future use of the bridge. Earlier consultation on this project was completed in 2003, addressing geotechnical drilling activities conducted as part of the foundation study, planning, and design of bridge retrofit and replacement alternatives. This geotechnical drilling was necessary to ensure safe and feasible location of the replacement structure in the design of several planning alternatives, and was considered to be an action independent of the actual bridge construction and future use. The present consultation addresses the effects of the proposed action, replacement of the existing SR 1 bridge crossing the Tenmile River and removal of the existing structure, as described in the biological assessment.

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Informal Consultation and Concurrence

In your letter initiating formal consultation, you did not specifically request that the Service concur with your determinations that the action, as proposed, would have no effect on the spineflower, the wallflower, the plover, the pelican, the murrelet, or the owl. Neither the Act's implementing regulations (50 CFR §402) nor Service policy (U.S. Fish and Wildlife Service and National Marine Fisheries Service 1998) specifically provide for the Service to concur with a determination of no effect on listed species. However, your request for consultation included six species for which you made a determination that the proposed project would result in no effects. The biological assessment included with your request for consultation provided information supporting your determinations. That information is included by reference and will not be repeated in this document. Therefore, in response to your request for consultation, the Service agrees with your determination that the action, as proposed and analyzed, will have no effect on Howell's spineflower, Menzies' wallflower, the western snowy plover, the brown pelican, the marbled murrelet, and the northern spotted owl. We base our concurrence substantially on the information you have provided in your biological assessment.

The spineflower, the wallflower, the plover, the pelican, the murrelet and the owl will not be addressed further in this consultation, except in the description of the consultation history, which resulted in the final project description and avoidance measures. Unless new information reveals effects of the proposed action that may affect these species in a manner or to an extent not considered, no further action pursuant to the Act is necessary relative to the effects of the proposed project on these species.

The following Biological Opinion addresses impacts of your proposed action on the tidewater goby.

BIOLOGICAL OPINION

Consultation History

Consultation to date on the proposed project is summarized as follows:

January 26, 1999: AFWO staff attended a project development team meeting held by Caltrans in Fort Bragg. At the meeting, Caltrans discussed alternatives and the environmental planning process for the replacement of the Tenmile River Bridge, a seismic retrofit project.

April 1999: We received a copy of a letter from Caltrans to the FHWA, dated March 26, 1999, with a biological assessment, dated March 1999, for tidewater goby and two listed salmonid species. Informal consultation was initiated at this time.

May 11, 1999: We received via facsimile (fax) a letter from the FHWA, dated April 6, 1999, requesting concurrence with the findings that the proposed foundation study would have no

effect on the Menzies' wallflower, Howell's spineflower, and western snowy plover, and it would be unlikely to adversely affect the tidewater goby.

June 1, 1999: We sent a letter to the FHWA stating that the available information was insufficient to assess the potential effects of the proposed action on Federally listed species. The letter resulted in a continuation of informal consultation, and identified additional information needs.

November 24, 2000: We received a letter from the FHWA, dated November 20, 2000, with a revised biological assessment, dated May 2000. The letter stated that the proposed foundation study may affect the tidewater goby and habitat for Menzies' wallflower and Howell's spineflower. FHWA requested formal section 7 consultation for the proposed action.

March 14, 2001: Mr. Falxa and Mr. Hansen visited an area potentially occupied by Howell's spineflower. The area occurred within the proposed project's impact area, and it was outside the area where plant surveys conducted in 1998, 1999, and 2000 found the spineflower.

March 21, 2001: We provided, via e-mail to Caltrans staff, comments and questions on the May 2000 biological assessment, and we requested additional information needed for formal consultation.

April 19, 2001: We received a letter from Caltrans, dated April 17, 2001, providing supplemental information on tidewater goby, Menzies' wallflower, and Howell's spineflower. The letter included information that responded to the Service's March 21, 2001, comments and questions.

July 26, 2001: Mr. Falxa, Mr. Hansen, and Ms. Embree visited the project site to evaluate the post-blooming distribution of spineflower. Spineflower plants were observed to be more widely distributed than noted in plant surveys during three previous years, and was also observed within the impact area for drill site B-5.

August 17, 2001: We received a letter from Caltrans, dated August 1, 2001, that provided supplemental information on Howell's spineflower and the effects of geotechnical drilling.

September 19, 2001: The Service transmitted its Biological Opinion which stated that the proposed geotechnical drilling at Tenmile bridge would not jeopardize the continued existence of the tidewater goby or Howell's spineflower, and its concurrence that the proposed action may affect, but is not likely to adversely affect Menzies' wallflower.

August 12, 2002: The Service received the FHWA's request to reinitiate consultation on the proposed geotechnical drilling activities for the Tenmile bridge, based on newly described alternative alignments to the proposed bridge replacement and the need to conduct drilling in areas not considered in the previous consultation.

November 26, 2002: The Service received a letter from Caltrans, dated November 21, 2002, wherein Caltrans reports its management decision to select Alternative C (previously referred to as the Value Analysis Alternative) as the alternative that will be constructed. All other build alternatives have been dropped from consideration. The letter served as notice from Caltrans to the Service that the endangered species consultation need only address potential impacts of drilling for Alternative C.

November 27, 2002: The Service received a letter, dated November 21, 2002, wherein Caltrans provided a revised map of the bridge alignment for Alternative C, the selected build alternative.

February 5, 2003: The Service transmitted the draft Biological Opinion to Caltrans for their formal review. Caltrans submitted their comments to AFWO on March 20, 2003.

April 2, 2003: The Service transmitted its final Biological Opinion to FHWA addressing effects to listed species likely to occur during geotechnical test drilling at the project site.

April 16, 2004: Ms. Embree submitted information to Mr. Bosch through e-mail describing ongoing Caltrans investigation of noise/vibration effects to fish from pile driving in aquatic habitats.

April 27, 2004: The Service attended a meeting with the National Marine Fisheries Service (NOAA Fisheries), Caltrans, and FHWA to discuss potential conflicts arising from recommended protection measures to conserve listed tidewater gobies and coho salmon in the Tenmile River estuary. At issue were the constraining limitations on in-water work the Service and NOAA Fisheries had recommended to protect these species during their respective breeding periods in and near the proposed bridge replacement site. Through this meeting, a viable solution was agreed to for inclusion in the project scheduling.

May 28, 2004: Ms. Embree delivered a printed copy of the draft biological assessment to AFWO and requested comments on that document. On June 1, 2004, an electronic copy was submitted by e-mail.

June 7, 2004: Mr. Bosch provided technical assistance to Caltrans through an e-mail to Ms. Embree. The technical assistance provided information on recently sighted plovers on the beach west of the project site, and provided recommendations to eliminated effects of the project on plovers.

June 9, 2004: Mr. Bosch submitted comments by e-mail on the draft biological assessment to Ms. Embree.

July 20, 2004: Caltrans submitted an early copy of its final biological assessment to AFWO as a courtesy copy of their request to FHWA to conduct formal consultation with the Service.

September 20, 2004: FHWA submitted its written request for formal consultation. This request was received at AFWO on September 23, 2004.

April 11, 2005: AFWO transmitted the draft Biological Opinion to Caltrans via email for their review and comment.

July 21, 2005: AFWO received Caltrans' comments on the Service's draft Biological Opinion, via email from Ms. Embree. At that time, Caltrans requested the Service and NOAA Fisheries attend a meeting to discuss concerns expressed by the California Department of Fish and Game (CDFG) regarding the level of take of anadromous coho salmon resulting from the adverse effects on in-water pile driving. Included in that email correspondence were two letters describing additional modifications to the proposed action as a result of these concerns.

July 26, 2005: Mr. Bosch informed Caltrans through an email to Ms. Embree that formal consultation would not proceed until Caltrans resolved disagreements with NOAA Fisheries and CDFG regarding the issue of take of coho salmon associated with driving of permanent and temporary piles necessary to construct the bridge.

August 24, 2005: Mr. Bosch met with representatives of Caltrans, NOAA Fisheries, CDFG, and Caltrans consultants to discuss potential effects of pile driving on coho salmon and tidewater goby in the Tenmile River estuary. During this meeting, options were explored to alter the timing and extent of pile driving to minimize the take of listed species, and mitigation measures were discussed.

January 10, 2006: Mr. Bosch participated in a telephone conference call with representatives of Caltrans, NOAA Fisheries, and CDFG to further discuss potential effects of pile driving on coho salmon and tidewater goby in the Tenmile River estuary. At question were the level of sound generated by pile driving of various pile types, the appropriate metric to measure the effects of that pile driving, the application of potential sonar or other monitoring techniques for estimating the extent of take, identification of appropriate mitigation sites, and other issues.

March 6, 2006: Mr. Bosch reaffirmed with Caltrans through an email correspondence, that the Service would be unable to complete the Biological Opinion for this project until FHWA had confirmed the final project description, including resolution of the take issues raised by CDFG an NOAA Fisheries, and requesting that the Service resume formal consultation and complete the Biological Opinion.

April 26, 2006: FHWA submitted a revised request for formal consultation (received May 1, 2006). This request included the document *Addendum to Biological Assessments Prepared for the Replacement of the Ten Mile River Bridge*, which describes modifications to the project description. Those modifications are described in detail in the updated project description in this Biological Opinion.

DESCRIPTION OF THE PROPOSED ACTION

Project Description Provided in September 2004 Biological Assessment

The proposed project is described in considerable detail in the September 2004 biological assessment. The project description in that document is hereby incorporated by reference. The reader may refer to that document for specific details or clarification regarding the design and construction of the new bridge and removal of the existing, outdated structure. The project description that follows provides a summary of the design features, timing, and construction techniques, as described in the 2004 biological assessment, that are salient to consideration of the effects of the action on listed species. Many aspects of that project description were modified subsequent to the transmittal of that biological assessment. The modifications to the biological assessment submitted by FHWA to the Service in April 2006 are summarized in a later section of this Biological Opinion.

Location

The project is located on SR 1 in Mendocino County, between mile posts 69.4 and 70.1, approximately 10 miles north of the city of Fort Bragg. The existing bridge crosses the estuary of the Tenmile River at a location approximately 488 m (1,600 ft) from the Pacific Ocean. The proposed new bridge will be located 16 m (52 ft) or less upstream (east) of the exist bridge, and will reconnect with the existing SR 1 road alignment immediately north and south of the existing bridge.

Structure Design

The new bridge will consist of a cast-in-place concrete and steel two-lane bridge meeting current design standards for seismic stability and traffic safety. The new bridge will consist of an eight-span superstructure supported by three piers (middle supports in the river), four bents (middle supports on land), and two abutments supporting the ends. Each pier and bent is anticipated to consist of two columns, each of which will be supported by several 0.9 m (3.0 ft) diameter Cast in Steel Shell (CISS) piles. End supports will consist of concrete seat-type abutments with foundations consisting of drilled or driven piles. Some imported fill material may be added at the south abutment; none of this fill will be placed within wetlands. Total length of the new structure is anticipated to be 451 m (1,480 ft), with an average width of 13.1 m (42.8 ft).

Caltrans has been permitted by the Regional Water Quality Control Board to use vertical deck drains and/or scupper drains to discharge stormwater falling onto the bridge deck directly into the Tenmile River. Water that falls on the bridge approaches must be diverted through appropriately sized and designed biofiltration structures.

Timing

Construction was initially expected to begin in March 2006, with completion anticipated by late 2007. However, allowing for potential delays, Caltrans anticipates the need to provide allowances for up to three years of work in waters of the Tenmile River, which could extend the

project into 2008. That schedule and timing was recently modified; changes are described in a later section of this project description. As described below, in-water work will be limited, in general, to the period June 15 to October 31 of the first year of construction, and to the period September 15 to October 31 of subsequent years, as needed.

Construction Techniques

Construction of the portion of the new bridge over land will require removal of some existing riparian vegetation in the work corridor. This work will be completed during March of the first year of construction to minimize impacts to nesting birds.

Access to bent sites and pier sites will occur along existing roads on the east side of SR 1 and over trestles temporarily constructed specifically for the purpose of crossing wetlands and open water. Trestles will be elevated a minimum of 1 m (3.3 ft) above the 100-year flood plain. The trestle network will be constructed and accessed solely from the south side of the river, and will be used for both construction of the new bridge and demolition of the existing bridge. Some access across the wetlands will entail the use of landing mats or of earth fill placed over geo-fabric.

The construction zone will be extend from approximately 14.5 m (48 ft) beyond the westerly edge of the deck of the existing bridge to 25 m (82 ft) beyond the easterly edge of the deck of the new bridge, for the entire length of the bridge. It will also include the bridge approaches and associated utility corridors. Existing wetland vegetation within this area will be preserved as much as possible, and all areas of wetlands beyond the construction zone will be marked as Environmentally Sensitive Areas (ESAs).

Falsework would be used to support construction of the new superstructure. This falsework would consist of piles or pads of concrete or timber resting on the surface of the ground. Each bent is anticipated to need four or five pad locations, all of which would be located above the ordinary high water mark. A total of approximately 90 timber piles or steel H-piles will be used to support the trestle and an additional 245 or more timber piles or steel H-piles will be necessary to support the falsework. Use of trestle and falsework will allow the contractor to work in the river without diverting the flow. They are designed to withstand high flow events. Pile driving in the open water for the trestle and falsework will occur during the period June 15 to October 31 during the first year of construction; additional work necessary to complete these structures would occur during the period of September 15 to October 31 of any subsequent years.

The contractor may use barges or small boats provided they use spud or jack anchors, they have a maximum draft not to exceed 14 inches, and their use is limited to times when the river is of sufficient depth to completely support the vessel. Additional specifications for the barge are described in detail in the biological assessment. Boats and/or barges may access the river from only one location, a launch site located approximately 420 m (1,380 ft) east of the existing bridge. This location has an existing haul road access to the river bank; no other launch sites will be authorized or approved.

Cofferdams will be constructed around all pier locations and around bent locations where water intrusion is anticipated. Driving of sheet piles for the perimeter of the cofferdams located in open water will occur during the period June 15 to October 31 of the first year, and during the period September 15 to October 31 of subsequent years. During dewatering of cofferdams, pumps will be double screened to minimize the risk of mortality to gobies or other fish that may be trapped within the cofferdam. A fisheries biologist familiar with all life stages of gobies and capture techniques will be responsible for ensuring that any fish present inside the cofferdam can be relocated back to the river upstream of the work area, as feasible. The fisheries biologist will record the number of each species of fish observed in the affected area, the number of fish relocated, and the date and time of collection and relocation. Within three months of fish removal activities, a report will be provided to the Service indicating appropriate information on the species, numbers, and evidence of mortalities.

Discharge to surface waters will be regulated under a site-specific National Pollution Discharge Elimination System/Waste Discharge Requirement (NPDES/WDR) permit. Sampling of discharges is anticipated to meet North Coast Basin Plan requirements to not increase turbidity by more than 20 percent over background levels. Water requiring further treatment will be pumped to land-based or mobile treatment facilities prior to being allowed to enter the river. Soil removed from cofferdams to facilitate pier construction would be transported to a land-based disposal site.

To construct the piers and bents, steel shells and CIDH piles are driven and drilled into the earth by vibratory or impact hammer until they reach required design tip elevation, then drilled out, fitted with reinforcing steel bars, filled with concrete, and capped. Columns are then constructed up from the caps. Following completion of the columns, bridge decking consisting of steel-reinforced concrete and tensioning tendons will be completed while supported on the falsework.

Following completion of the columns, bridge superstructure consisting of steel-reinforced concrete and pre-stressed tendons will be completed while supported on the falsework. Following completion of the new bridge, the old bridge will be demolished and removed completely. The portion of the old bridge over land may be dropped onto the ground over fabric covered by temporary fill to aid in the containment and collection of concrete debris. Removal of portions of the old bridge over the water will be done over extensions of the construction trestle or over new trestle constructed on approximately 64 timber piles or steel H-piles. Approximately 34 additional piles would be needed to support a platform under the existing bridge, providing a place to drop the old bridge. Piers supporting the old bridge would be removed to a depth of 1 m (3.3 ft) below final grade of the river bed, or lower if possible. Driving piles in the open water for the construction of trestle work associated with bridge removal would be conducted between June 15 and October 31 of the first year of the project, or between September 15 and October 31 of any subsequent year, if needed. All temporary trestles, falsework, and containment systems used to construct the bridge and demolish the old bridge would be completely removed when they are no longer needed.

The installation of the temporary piles will not include the use of sound attenuation systems. Due to the estimated 335 or more piles required to construct the trestle and falsework for the new bridge and demolition of the old bridge, using any kind of attenuation system would add a prohibitive amount of cost to the project and, more importantly, would not appreciably change the level of impact to listed species. In addition, installing the large number of piles would extend the project multiple years beyond the current projected completion date of late 2007 or 2008, should sound attenuation systems be used at all pile driving locations.

The proposed access to be used for demolition of the existing bridge lies within an area currently occupied by either riparian vegetation or open sand not supporting spineflower. Caltrans proposes to protect the entire population of spineflower within an ESA, by limiting all access and work to within 48 ft of the existing bridge. The population will be fenced off and no personnel, equipment, or material will be allowed to enter the area. In order to minimize impacts to the spineflower, the access route to be used during demolition of the existing bridge will be shifted slightly south and riparian vegetation will be removed (stumps ands roots will remain) to allow access.

Staging Area
A staging area devoid of vegetation has been identified on an unpaved, gravel pullout directly adjacent to SR 1 at post mile 66.0, approximately 0.5 miles south of the bridge.

Disposal Site
A disposal site has been identified on lands currently within the Sandhill Timber Harvest Plan (THP) operated by Hawthorne Timber Company, LLC, approximately 5.6 kilometers [km] (3.5 miles [mi]) north of the project site.

Modifications to the Project Description April 2006

The biological assessment for the Tenmile River Bridge replacement project was transmitted to the Service in September 2004. Modifications to the original Project Description have occurred since the 2004 assessment was prepared. The following subsections collectively provide a description of each of the changes, as submitted to the Service in April 2006. The effects analysis later in this Biological Opinion includes changes in the project as described below.

Construction Window
The beginning and end date for the entire project has been changed to the following: Construction of the new bridge is expected to begin in February 2007 with completion of the entire project anticipated by December 2009.

Night Work
The Biological Assessments stated that pile driving would not occur at night. However minor construction activities, such as maintenance of equipment and delivery of materials for subsequent days work, may occur at night. If lighting is required on the trestle, the lights will be shielded to avoid illumination of the river.

Attenuation of the Temporary Piles
Not originally proposed, the project now proposes to use a dewatered isolation casing, or a similar system, to drive temporary H piles in the river. Dewatered isolation casings create an "air" space between the temporary H pile and the surrounding river. This system was utilized on the Humboldt Bay Bridges Seismic Retrofit project and was found to provide about 9 dB of attenuation. As described in the attached Tenmile River Bridge Replacement Project - Hydroacoustic Report, the driving of temporary H piles through a dewatered isolation casing should result in peak pressure levels no higher than 190 dB at 10 meters.

Driving and Dewatering of Cofferdams
Not previously discussed in the Biological Assessments, the cofferdam piles in the river will be driven with a vibratory hammer only. Specifying that a vibratory hammer will he used is a result of a recent Port of Oakland project that recorded a peak underwater sound pressure level of 177 dB when a vibratory hammer was used; far below the recorded 205 dB for an impact hammer.

The 2004 biological assessment stated that after cofferdam sheets are installed, the water would be pumped out of the cofferdams to allow a biologist to rescue any trapped fish. Since the cofferdams have not been sealed from ground water intrusion, continuous pumping will be necessary to sufficiently de-water for the biologist's access. After fish are rescued, the water level inside the cofferdams will be maintained below the existing mud line by continuous pumping in order to provide attenuation for noise during pile driving.

Size of Permanent Piles
The 2004 biological assessment stated that the columns of each bent and pier would be supported by 0.9 meter (3-foot) diameter Cast in Steel Shell (CISS) piles. The diameter of the permanent piles will be slightly smaller: 0.7 meter (2.5 feet).

Trestle Height
The 2004 biological assessment stated that the trestles would be built 1 meter (3.3 feet) above the 100-year flood elevation. FHWA now proposes to have the trestle platforms constructed 1 meter (3.3 feet) above the ordinary high water elevation.

Access for Demolition of the Existing Bridge
According to the original project design, access for demolition of the existing bridge included use of a route from the haul road that could have potentially resulted in affecting the federally endangered and state threatened Howell's spineflower. It has since been determined hat construction work associated with demolition of the bridge can be limited to 14.5 m (48 ft) west of the west edge of the existing bridge. The area beyond the westerly construction boundary will be fenced as an Environmentally Sensitive Area. Thus the existing spineflower population as well as the area where the species could expand its distribution (in the "open" area between the existing bridge and the existing population) will be protected.

Hydroacoustic Monitoring
Noise levels during pile driving will be monitored according to the Ten Mile River Bridge Replacement Project - Hydroacoustic Report, dated September 16,2005, and the Hydroacoustic Monitoring Plan for the Ten Mile River Bridge Replacement Project, dated January 30, 2006. These reports are provided as Attachments 1 and 2 to the April 2006 Addendum.

Fish Passage Enhancement Project
To fulfill the California Department of Fish and Game's (CDFG) mitigation requirements under the California Endangered Species Act, a separate project to enhance fish passage for coho salmon (*Oncorhynchus kisutch*) will be undertaken. Project design and environmental clearances will be completed at a later date. The fish passage project will occur at one of the following sites, as recommended by CDFG:

- Dunn Creek at Post Mile 92.83
- An unnamed tributary to Cottaneva Creek at Post Mile 89.20
- An unnamed tributary to Cottaneva Creek at Post Mile 88.71

Additional Disposal Sites
It, has been determined that the currently proposed disposal site, located on Route 1 in Mendocino County at Post Mile 66.0, may not be adequate for the disposal needs of the project. Four additional optional sites have been reviewed and may be used during construction. The sites are located in Mendocino County on Route 1 and are described below:

- PM 70.3. This site is located on the Hoechstetter Ranch. This site has not been surveyed.

- PM 81.25. This site is within Caltrans' right-of-way and has been used in the past by Cal trans' Maintenance crews for disposal of material. The capacity of the existing disposal site is currently over-full. but expansion may be possible to the east. Ruderal vegetation, including pampas grass, currently covers the area that could be used. A drainage ditch to the east of the existing site would be avoided by incorporating a minimum 100-foot setback.

- PM 80.50. This site is located on the Howard Creek Ranch property. A couple of areas upslope from the main field may be suitable for disposal of material.

- PM 74.74. This potential disposal area is located on the Gary Quinton property. Vegetation in the area available for disposal use consists mostly of upland coastal scrub and/or ruderal vegetation. The coastal scrub will be preserved if the contractor elects to use this site.

For any of these additional optional disposal sites the contractor chooses to use, botanical (to be conducted during spring/summer months) and wetland surveys will be completed. Areas to be

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preserved, including wetlands if present. the coastal scrub at PM 74.74, and appropriate setbacks, will be flagged.

Change in Superstructure Design

Changes in project design, as required by the California Coastal Commission in its Federal Consistency Certification, include modifications to both the rail design and the shoulder on the west side of the new bridge. Initial design called for two 2.4-meter (7.8-foot) shoulders and two 0.5 meter (1.7-foot) wide Type 80 Concrete Barrier Railings. Changes include a decrease in shoulder width to 1.8 meter (6-foot) shoulders and the incorporation of a 1.5-meter (5-foot) sidewalk on the west side of the bridge. The bridge width increases by 0.6 meter (2 feet) and the centerline of the bridge shifts east 0.3 meter (1 foot). These modifications result in superstructure redesign only; no substructure (which includes the columns, footings, and piles) redesign work is necessary.

At the Ten Mile River Bridge project, measures have been incorporated into the project in an effort to attenuate high levels of underwater sound that are expected to occur during pile installation. Instead of using an impact hammer, a vibratory hammer is proposed to be used to install the sheet piles for the cofferdams around the piers of the proposed and existing bridge. This change is expected to reduce peak underwater sound pressure levels by 28 decibels (from 205 to 177 dB re 1 μPa at 10 m from the pile). A dewatered cofferdam will be used in order to create an air space within which installation of the 30-inch diameter in-river permanent piles will occur. The air space should attenuate underwater sound pressure levels in the surrounding estuary. Caltrans anticipates that peak underwater sound pressure levels of 190 dB re 1 μPa will occur at a distance of 10 m from the in-river permanent piles being installed. Dewatered isolation casings will be used in order to attenuate underwater sound during the installation of the in-river temporary piles used in the trestle and falsework construction. Similar to the in-river permanent piles, Caltrans anticipates that peak underwater sound pressure levels of 190 dB re 1 μPa will occur at a distance of 10 m from the in-river temporary piles being installed.

The installation of the sheet piles for the cofferdams and the in-river temporary piles for the trestle and falsework is proposed to occur from June 15, 2007, through October 31, 2007, from September 15, 2008, through October 31, 2008, and from September 15, 2009, through October 31, 2009. Caltrans estimates that it will take approximately 900 strikes with an impact hammer to install each in-river temporary pile. The installation of the land-based permanent and temporary piles is proposed to occur year-round. Caltrans estimates that it will take approximately 1,000 strikes with an impact hammer to install each land-based permanent and temporary pile.

The installation of the in-river permanent piles is proposed to occur year-round, with a maximum of 15 piles installed on any given day. Caltrans estimates that it will take approximately 1,000 strikes with an impact hammer to install each in-river permanent pile, thus 15,000 hammer strikes per day if 15 piles are installed. No specific work window is provided; therefore, the

Service assumes that this work can occur at any time during the year including during the breeding season of the goby.

Action Area

The action area includes all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action [50 CFR §402.02]. For purposes of this consultation, the action area includes all tidally influenced reaches of the Tenmile River, in combination with its immediate shoreward zone, and includes its waters and substrates. The action area of this project also includes all dune and wetland habitats within such distance of the proposed and current bridge alignments that habitat elements may be directly or indirectly affected by the proposed activities, including vehicle access, alterations of hydrology and vegetation, and disposal of spoils. Further, the action area includes all areas within the immediate vicinity of the proposed project that may be subject to action-generated sound levels that exceed ambient conditions resulting from normal, daily use of the roadway, bridge, adjacent facilities, and disposal sites.

STATUS OF THE SPECIES (*Tidewater Goby*)

A detailed description of the goby, its biology, the reasons for its decline, and threats to its survival can be found in the final rule listing the species (U.S. Fish and Wildlife Service 1994), the proposed rule to delist northern goby populations (U.S. Fish and Wildlife Service 1999), the final rule withdrawing the Service's proposal to delist the northern goby populations (U.S. Fish and Wildlife Service 2002), and the recovery plan (U.S. Fish and Wildlife Service 2005). The following text summarizes that information and supplements it where new information has recently become available.

Life History

The tidewater goby is a small, and grayish-brown fish, approximately 5 cm (2 in) long, in the taxonomic family Gobiidae. It occurs in coastal brackish-water habitats, such as lagoons, tidal bays, sloughs and estuaries of rivers and streams along the coastline of California. The species is unique among Pacific coast fish in its restriction to brackish waters of coastal wetlands.

Tidewater goby habitat is characterized by brackish shallow lagoons, brackish marshes, and lower stream reaches where water is fairly static but not stagnant (Moyle 1976, Swift et al. 1989, Irwin and Soltz 1984, Swenson 1995). The species is generally found in waters with salinity levels around 10 parts per thousand, but can tolerate a wide salinity range. Gobies have been found in salinity levels from 0 to 40 parts per thousand, water temperatures from 8° Celsius (C) (46° Fahrenheit [F]) to 23° C (73° F), and water depths from 25 to 100 centimeters (cm) (10 to 39 in) (U.S. Fish and Wildlife Service 1999; Swift et al. 1989, Capelli 1997, Irwin and Soltz 1984). Gobies are usually found in waters less than 1 m (3 ft) deep, but they have been found in deeper waters. The lack of records from deeper waters may be an artifact of the sampling methods. They typically occur over a sandy or mixed sandy/silty bottom with sparse vegetation.

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They are weak swimmers and generally avoid swiftly moving waters. Tidewater gobies prey opportunistically on benthic invertebrates including small crustaceans, insect larvae and snails (Swift et al. 1989, Irwin and Soltz 1984, Swenson and McCray 1996).

Adult tidewater goby do not possess swim bladders, as do many other fish species, including all species of salmonids. Most gobies have convergent evolutionary loss or reduction of the swim bladder, but a similar structure, assumed to be a vestigial swim bladder, is commonly seen in the larval stages (Robbins and Ray 1986, Nelson 1994). Wang (1982) and Swift et al. (1989) mention swim bladders in tidewater goby larvae, but do not mention them when describing the juvenile or adult life stages. Swim bladders are reduced or lost in the juvenile and adult life stages presumably as an adaptation to their benthic existence, where the presence of a swim bladder and its resulting buoyancy would be counterproductive.

When available dissolved oxygen within the water column drops, as in summer alga blooms or when hydrogen sulfide builds up in substrate sediments, tidewater goby habitat becomes restricted. Habitat where there is an influx of oxygenated water, as in the upper reaches of the estuary or along the seaward margin of the lagoon where waves wash in from the ocean is required for this species to survive. In relatively undisturbed estuaries, fish may be present throughout the lagoon, particularly over shallow sandy substrates.

Most individuals complete their life cycle within one year. Spawning usually occurs in spring and summer, but can occur in any month (Swenson 1995). Males excavate burrows, typically in clean coarse sand but also in mud, in which females lay and average of approximately 400 eggs in the burrow, after which the male guards the eggs. Larvae emerge in nine to ten days, and live in vegetated areas of estuaries until they reach 15 to 18 mm (0.5 to 0.7 in) standard length (Moyle et al. 1995).

The tidewater goby occurs in loose aggregations of a few to several hundred individuals. Large areas of habitat, such as Lake Talawa/Lake Earl in Del Norte County, can provide habitat for tens of thousands of individuals at peak population. Larval gobies are found mid-water around vegetation until they become benthic (Swift et al. 1989). Although the potential for year round spawning exists, it is probably unlikely because of seasonal low temperatures and disruptions of lagoons during winter storms. The tidewater goby likely breeds during a period of February through November in Tenmile River. Tidewater goby in northern California may have a slightly bimodal breeding period with peaks in spring and early fall.

Status and Distribution

The tidewater goby occurs only along the coastline of California from Tillas Slough in Del Norte County south to Agua Hedionda Lagoon in San Diego County. Tidewater gobies historically occurred in at least 87 California coastal lagoons (Swift et al. 1989), but have disappeared from about 50 percent of formerly occupied habitats since 1900. Tidewater goby are known to occur in Mendocino County at three streams (Tenmile River, Virgin Creek, and Pudding Creek) north of Fort Bragg, and in two small, unnamed lagoons at the north end of Manchester State Beach,

north of Point Arena (Swift et al. 1989). Tenmile River is the northernmost goby population in Mendocino County. North of Tenmile River, the rugged coast of southern Humboldt County precludes occupancy by the goby for an extended reach of the coast from Tenmile River to the Eel River delta. The Service assumes this area represents an impassable barrier to dispersal and recolonization between these populations at all but geologic time scales.

Recently, at least two new or reestablished populations of gobies have been reported, based on additional surveys. The closest of these new records to the proposed action occurs near the mouth of the Eel River, in Humboldt County, where several gobies were located in a small oxbow slough in the delta of the Eel River. The other reestablished population was found at Arroyo Grande Creek/Lagoon in San Luis Obispo County. No new populations have been reported in Mendocino County.

Within the Tenmile River estuary, gobies have been located in shallow water both downstream and upstream of the existing bridge. Gobies were reported at locations up to 2 miles upstream of the bridge, but have also been identified as close as 200 m downstream of the bridge. Arrow gobies (*Clevelandia ios*) have also been located downstream of the bridge.

Factors responsible for the historic decline and extirpation of goby populations include: development of coastal saltmarsh and riparian habitats, upstream water diversions that alter downstream flows, drought, groundwater overdrafting, and agricultural and sewage discharge (i.e., pollution). Existing threats to the goby include habitat loss (e.g., urban development) and degradation (e.g., siltation), artificial breaching of creek mouths, extreme weather and streamflow conditions, and predation by introduced species including mosquitofish (*Gambusia* spp.), sunfish (*Lepomis* spp.), and bass (*Micropterus* spp.). Approximately one-quarter of the known populations apparently were lost between 1984 and 1990 (Swift, in Swenson 1995). Of approximately 84 populations currently extant, at least 34 are considered viable (Capelli 1997).

The Service designated critical habitat for the goby in November 2000 (U.S. Fish and Wildlife Service 2000), consisting of 10 coastal stream segments in Orange and San Diego Counties, California. No critical habitat has been designated in Mendocino County.

On June 24, 1999, we proposed to delist the tidewater goby north of Orange County, California, while retaining tidewater gobies in Orange and San Diego Counties as an endangered distinct population segment (U.S. Fish and Wildlife Service 1999). We sought additional information regarding the delisting proposal, which resulted in a reopening of the comment period on February 15, 2000. The public comment period on the proposal was reopened for a second time on January 3, 2001, and closed February 2, 2001. On November 7, 2002, the Service published its final decision (U.S. Fish and Wildlife Service 2002) on this proposed delisting. Based on public comment and additional data provided by species experts, the Service determined that the species was not as secure as previously believed. This significant new information supported the Service's decision to withdraw its proposal to remove northern populations of the tidewater goby

from the list of threatened and endangered wildlife. Thus, the species remains listed as endangered throughout its range for the foreseeable future.

On November 18, 2004, the Service released a draft recovery plan (U.S. Fish and Wildlife Service 2004a, 2004b) for public comment and peer review. Following that comment and review, the final recovery plan was approved on December 7, 2005 (U.S. Fish and Wildlife Service 2005), and made available on January 23, 2006 (71 FR 3524). The recovery plan includes the data and other information available at that time (i.e., as of September 2005) on goby status, distribution, and recovery needs; provides recommendations for recovery tasks necessary for the conservation of the species; and specifies recovery criteria to downlist to threatened status, or remove the species from the federal list of threatened and endangered species (that is, delist).

Conservation needs for this species have been discussed in detail in several published, publicly available documents (U.S. Fish and Wildlife Service 1994, 2002, 2005). These conservation needs address threats to the species such as: destruction of its habitat from dredging, lagoon breeching, construction activities, or other operations that alter water levels, affect water quality, or alter vegetation or substrate in estuarine habitats; predation from native and non-native fish and frog species; competition from introduced species, including other species of goby; pollution from urban development and agricultural runoff, including the algal blooms that may be precipitated from this nutrient input; sedimentation from cattle grazing; and water withdrawal, which may exacerbate the effects of seasonal and other periodic drought.

ENVIRONMENTAL BASELINE (in the action area)

Few data exist on the current or historic numbers, distribution, or reproductive capabilities of the goby in the Tenmile River. However, based on limited survey data, the goby is known to occur in Tenmile River (Swift et al. 1989, Goldsmith pers. comm. 2005).

A snorkel and net survey performed in the spring and summer 1994 by the California Department of Fish and Game and College of the Redwoods did not detect tidewater goby in Tenmile River. The survey was performed from just west of the SR 1 bridge to approximately 1 km upstream. More recently, sampling conducted in October 1999 detected gobies in the reach between the bridge and about 200 m (660 ft) downstream, where at least 32 gobies were netted (Swift, in litt. 2000).

The Service conducted a survey for tidewater gobies in the Tenmile River in July 2003. The survey was part of an effort to develop a protocol for presence-absence surveys for the species. The survey began downstream of the bridge and concluded approximately two miles upstream. Fifteen seine hauls using a 3 m (10 ft) wide net were conducted throughout the study area. Arrow goby were captured downstream of the bridge. Tidewater goby were found only at the last survey site, two miles upstream of the bridge. Goby tubes, the openings of goby burrows, were found downstream of the bridge. It was assumed the tubes were made by Arrow gobies since

they were the only species of goby found in the area. However, the potential that the tubes were constructed by tidewater gobies can not be ruled out. Based on these survey data and the current condition of the habitat, tidewater goby populations are presumed to be extant in the Tenmile River estuary. Due to similarities in habitat between documented goby locations and the work area, tidewater gobies are assumed to occupy the wetted channel within the action area.

These data provide no information regarding the reproductive rate, population structure, or exact distribution of tidewater goby within the Tenmile River, its estuary, or other suitable habitats within the coastal area of northern Mendocino County.

The river in the vicinity of the bridge provides suitable habitat for the tidewater goby. The substrate around the bridge does have a minor mud component. However, lab research indicates tidewater goby use a wide range of substrates and salinity. They apparently do not use substrate made solely of sand. Within the estuary of the Tenmile River, the available tidewater goby habitat encompasses approximately 30 to 50 ha (74 to 124 ac). This locality is all privately owned, except for the highway right-of-way and a small portion of State parks.

The decline of the goby throughout its range can be attributed to upstream water diversions, artificial breaching or draining of coastal lagoons, pollution, siltation, and urban development on adjacent lands. These threats continue to affect the remaining goby populations. Small population numbers, coupled with a high level of fragmentation and apparent isolation of existing populations, has decreased the probability of genetic exchange between populations, and has also reduced opportunities for re-colonization of unoccupied suitable habitats. These factors likely affect the goby population in Tenmile River.

Specific threats in the action area include highway construction and maintenance, dry season artificial breaching, and potential chemical contamination from highway accidental spills. The Tenmile River is designated as "Water Quality Limited" by the State Water Resources Control Board. Pollutants and stressors and their respective potential sources include sedimentation and siltation (silviculture, road construction and maintenance) and temperature (habitat modification, removal of riparian vegetation, nonpoint source).

The *Recovery Plan for the Tidewater Goby* (U.S. Fish and Wildlife Service 2005) identifies six recovery units from Del Norte County to San Diego County. The North Coast Recovery Unit, including Del Norte, Humboldt and Mendocino Counties, includes six recovery subunits. The Tenmile River estuary is identified as Recovery Subunit NC-4a. The recovery plan specifies (p. 41) that the tidewater goby may be considered for downlisting from endangered to threatened status when a metapopulation viability analysis demonstrates that near all recovery subunits have a 75 percent probability of persistence for at least 100 years, and when individual management plans are prepared that cumulatively cover the full range of the species. For the North Coast Recovery Unit, this probability of persistence applies to at least five of the six subunits. The plan also states that the species may be considered for delisting (i.e., removed from the list of threatened and endangered species) when the conditions for downlisting have been met and a

metapopulation viability analysis demonstrates that all recovery subunits have a 95 percent probability of persistence for at least 100 years. Hence, persistence of the tidewater goby within the Tenmile River estuary is essential to future conservation and recovery of the species range-wide.

Previous Federal actions in the action area which affected the species include a previous strengthening of the Highway 1 bridge for seismic reasons, addressed in a Biological Opinion issued by the Service's Sacramento Fish and Wildlife Office (file number 1-1-96-F-126). In April, 2003, the AFWO issued a Biological Opinion (file number 1-14-1999-184.3) regarding the effects of geotechnical drilling on the goby and Howell's spineflower.

EFFECTS OF THE PROPOSED ACTION

Limited information is currently available regarding the population, distribution and reproduction of gobies in the action area. Therefore, the effects of this action on gobies in the Tenmile River and its estuary are expressed in terms of its effects on the species' habitat and an unknown number of gobies within that estimated area of habitat. Precise estimates of the numbers of gobies (including adults, larval juveniles, and eggs) affected by project activities are not possible given a general lack of data about population density in the action area. However, estimates of the area of affected habitat, and the relative likelihood that gobies might be affected by short- and long-term adverse effects of the action, are possible. Based on (1) this estimate of the area of affected habitat, (2) the likely proportion of total habitat within Tenmile River and its estuary affected by the proposed action, and (3) the overall duration of those effects, the Service can estimate the overall effect of the proposed action on the tidewater goby population.

In the following discussion, we indicate the likely sources of adverse effects to gobies from the proposed action, and estimate the extent of effects through potential alterations of habitat, and through potential injury, mortality, and loss of reproduction. We also estimate the extent of effects in time and area.

Tidewater goby are assumed to occur in that portion of the action area within the estuary under and adjacent to the bridge, based on the information available from past surveys and the current condition of the habitat. Given the seasonal variation in water level in the estuary in response to variation in river flow, sand bar accretion, and natural and human-caused breeching, the habitat actually available to gobies will fluctuate in area and extent both within and between years. For purposes of this analysis, the Service's estimate of suitable habitat available to gobies during project implementation, specifically the population of gobies susceptible to direct and indirect effects from the project, include all areas of the estuary inundated by water at any time during the project period, provided those areas also contain other necessary features characteristic of suitable habitat for the species.

In general, effects on the goby and its habitat would primarily occur in the immediate vicinity of the action area, but could also occur to a limited extent outside the action area. The effects of

habitat modification and removal are expected to be minor in relation to the total area of suitable habitat in the Tenmile River and its estuary, and are anticipated to be temporary in duration.

Direct Effects

Direct effects to the species include those effects that result in mortality or injury to individual gobies or eggs through: (1) direct contact with construction equipment or materials, (2) desiccation or other injury from dewatering of cofferdams, (3) injury that might occur during trapping, handling, and relocation, (4) barotrauma and related impacts during pile driving, (5) damage to adults or eggs resulting from alteration or collapse of breeding burrows, (6) direct contact with waste materials such as concrete or piles during removal of the existing bridge and temporary falsework, and (7) impacts resulting from the use of barge or boats working in the water. Direct effects to gobies would also include alterations in behavior by the species in response to barotrauma and other stimuli that result in the species altering important behaviors including, but not limited to, feeding, breeding and sheltering.

Scientific Basis for Assessing the Effects of the Proposed Action

This section provides a summary of information regarding the potential effects of similar activities on fish species in general, and describes the scientific basis for the Service's findings. From this scientific basis, the sections that follow describe the specific effects of the proposed action on the tidewater goby.

Barotrauma

The pathologies associated with exposure to drastic changes in pressure are collectively known as barotrauma. In fish, these include hemorrhage and rupture of internal organs, including the swim bladder, the inner ear, eyes, blood, nervous system, kidneys, and liver. Death can be instantaneous, occur within minutes after exposure, or occur several days later. Fish can also die when exposed to higher sound pressure levels if exposed for longer periods of time. Even if mortality does not occur, fish exposed to high sound pressure levels may experience injury, stress, changes in behavior and growth rates, a startle response, or no effects whatsoever.

The degree to which an individual fish exposed to underwater sound will be affected (ranging from a startle response to immediate mortality) is dependent on a number of variables, including:

- Species of fish
- Size of the fish
- Presence of a swim bladder
- Sound pressure intensity and frequency
- Effectiveness of a sound attenuation system, if utilized
- Presence of predators

It has long been known that underwater explosives can cause injury and mortality to fish. The Department of the Navy conducted a series of experiments to determine the effects on fish from underwater explosions (Goertner et al. 1994), which resulted in significant differences in effects to fish depending on whether or not they had swim bladders. Thus it is the swim bladder, inflated with gas, which expands rapidly as the pressure wave passes through the fish that likely causes the observed injuries to internal organs. The most susceptible tissues that are injured during exposure to underwater sound produced from pile driving are the soft-tissue organs surrounding the swim bladder, such as the liver and kidney.

Although underwater sound pressure waves generated during pile driving are different in several ways from those generated during explosions, the mechanism of injury (i.e. swim bladder expansion) may be similar. The most important differences between the two are the repetitive nature of pile driving and the overpressure-underpressure oscillations within the pile driving signal. When combined with the multiple pile driving strikes to which most fish will be exposed, these repetitive oscillations likely cause the swim bladder to act like a drum, and although any single low magnitude pulse may not result in injury to the internal organs, the repetitive nature of the sound produced during pile driving has been shown to have injurious consequences.

The effects of barotrauma and its associated impacts on fish is not well understood at this time. Recent research and studies have only begun to establish an understanding of the effects of intense noise generation, such as from explosives and pile driving in water bodies. Some species, especially salmonids, have received greater attention, due to their economic importance and the availability of study specimens upon which to conduct research on this aspect of their potential mortality. Even in the case of economically important species, however, few studies have been conducted as scientific experiments, limiting their applicability to conditions not precisely duplicating the experimental conditions. In contrast to salmonids, the tidewater goby has not been the subject of research in this field. Therefore, documenting the effects of activities such as pile driving becomes more problematic and much less certain than for species such as salmonids.

Information concerning the possible damaging effects of pile driving on salmonids and other fish species has begun to slowly emerge over the last few years. Information learned thus far on other fish species, especially salmonids, can be correlated to some degree to gobies. Virtually no species-specific information exists regarding the effects of pile driving on gobies themselves, or on the burrows that the species constructs in which to lay its eggs. Pile driving could also result in the damage and collapse of burrows, an effect to which salmonids are not susceptible. Our conclusions are based on the following information summarized in this and following sections from more detailed data provided in the biological assessment and other sources.

At lease two factors complicate the assessment of effects of intense underwater noise, as it relates to the goby. Gobies are small in length and mass, rarely exceeding 3 cm (2 in) in length. Barotrauma effects generally decrease with increased body size, suggesting that the small goby would be more susceptible to barotrauma that other species, such as salmonids, that are larger in

size during most life stages. On the other hand, gobies lack a swim bladder in the adult and juvenile stages, when they are primarily benthic in nature. Goertner et al. (1994) reported that species lacking swim bladders are apparently much less susceptible to the effects of barotrauma than are species with swim bladders. Therefore, these two factors may somewhat offset in their influence on barotrauma in gobies. However, during the pelagic life stage of gobies (the first few weeks after birth), these very young fish possess an air chamber which may mimic the effects of having an air bladder when it comes to impacts such as barotrauma.

Although fish exhibit a startle response during the first few acoustic exposures, they do not necessarily move away from areas of very loud underwater sounds and can be expected to remain in the area unless they are carried away by currents or normal movement patterns. During its relatively long breeding season, the tidewater goby is tied to its breeding sites. Hence, adult tidewater gobies are likely to remain in or near the source of elevated sound, as a behavioral response to territorial defense and breeding site protection. Further, gobies are relatively poor swimmers (compared to many species) and are incapable of rapid movement away from a pile driving site, even if they should attempt to move away from the stimulus. Finally, movement of planktonic larvae of the goby is substantially dictated by water currents in the impact area, so would not be expected to move away from the impact area other than as a result of current flows. Therefore, the Service will assume that gobies will remain in the vicinity of a construction site during pile driving activities and be subject to the cumulative impacts of multiple pile strikes.

A peak noise reading of 190 decibels (dB) has been estimated to be the level at which an adverse effect could occur to salmonids. Behaviors that may be exhibited during pile driving include anxiety indicated by a change in swimming behavior. A fish may display a startle response to the first few strikes of a pile. A startle response does not by itself indicate that a fish may be injured, but such behavior suggests it perceives a stimulus indicating potential danger in its immediate environment. A reading of 204 dB has been estimated to be the level at which instant mortality may occur in salmonids, with delayed mortality occurring at a level somewhere between 190 and 204 dB. It is unknown if noise levels resulting in delayed or instant mortality for salmonids would be similar for non-salmonid fish such as the goby. The tidewater goby does not possess a functional swim bladder in the adult stage. Therefore, pile driving effects to the early life stages of tidewater goby may be similar to that reported for salmonids, but adult gobies are anticipated to suffer lesser barotrauma injury in the adult stage due to the lack of a functional swim bladder.

Studies conducted during pile driving operations at the Noyo River Bridge in Mendocino County indicate that driving temporary piles may adversely affect listed species. Peak noise levels taken while steel H-piles were driven in shallow water (1 to 2 m [3.3 to 6.6 ft] deep, conditions similar to the Tenmile River), reached 174 dB at 23 m (75.5 ft) from the source. Attenuation systems were not utilized during these studies. Considering these data, even at a distance of 10 m (32.8 ft) from the unattenuated pile, the noise level would probably not reach 190 dB. However, a peak noise level of 190 dB might be reached when measured directly adjacent to the piles.

Limited data from the Humboldt Bay Bridge project in Humboldt County revealed that driving a 0.9 m (three-ft) pile in a dewatered cofferdam resulted in a peak noise level of 169 dB at 10 m (32.8 ft) from the source. This level of noise is well below the 190 dB threshold at which salmonid species are considered to experience direct mortality. This conclusion is anticipated to be true for the goby as well.

Modified Behaviors

Data on the effects of pile driving specific to behavior of tidewater goby is lacking, although it can be expected that pile driving may disrupt normal behavior patterns of gobies related to feeding, breeding, and sheltering. Furthermore, unlike salmonids, gobies breed in the area where pile driving will be occurring. They may not be able to move away from the disturbance fast enough to avoid direct injury or mortality. In addition, pile driving may result in gobies abandoning their burrows and potentially losing a reproductive effort.

Vibrations

Another potential source of disturbance to wildlife is vibrations caused by various construction equipment. Intense vibrations may occur in the immediate vicinity of pile driving. Few experimental data exist that evaluate the effect of vibrations on wildlife. The following information, summarized from more detailed information provided in the biological assessment, is based on how vibrations could affect humans as well as structures, including goby burrows.

Vibration sources may be continuous, such as factory machinery, or transient, such as explosions. Pile driving, pavement breaking, blasting, and demolition of structures generate some of the highest construction-related vibrations. These four operations are potentially damaging to buildings at distances of less than 7.6 m (25 ft) from the source.

Two different soil categories (weak or soft soils and competent soils) affect the transmission of vibrations near pile driving. Competent soils provide more resistance to advancing piles and therefore generate higher vibration levels near the source than do piles driven in weak or soft soils. Vibrations in competent soils, however, tend to drop off more rapidly with distance than those in weak or soft soils. It is known that clay soils provide more resistance to advancing piles and therefore generate higher vibration levels near the source than those in weak, sandy soils, such as those found in the Tenmile River.

The degree of effect from pile driving depends on many factors, including: (1) timing of migration and distribution of fish, (2) duration of fish presence in the project area, (3) size and force of the hammer strike, (4) water depth, (5) distance of fish from the pile, (6) depth of the fish in the water column, (7) amount of air in the water, (8) the texture of the surface of the water including size and number of waves on the water surface, (9) bottom substrate composition and texture, (10) size of the fish, (11) species of fish, (12) physical condition of the fish, and (13) effectiveness of the sound/pressure attenuation technology. Some of these effects are poorly understood and generally unpredictable under project-specific field circumstances.

Direct Physical Effects from the Proposed Action

Based on information regarding barotrauma and its effects on salmonids and other fish species, and information regarding effects of vibrations on soil structure, the Service concludes this project component is likely to result in disturbance to the species and possibly injury or mortality of some individuals.

Effects from Installation of Temporary Piles

Should the noise levels reach or surpass 190 dB during driving of the temporary piles and cofferdams, the tidewater goby may be adversely affected by injury or direct mortality of adults, eggs and emerging fry. Even at levels below 190 dB, gobies may be adversely affected if elevated sound levels occur for prolonged periods of time, or if these elevated sounds cause gobies to move away from breeding sites, especially occupied breeding burrows.

Although data are lacking on how tidewater goby burrows withstand vibrations from pile driving, several project-specific conditions should be considered. The temporary and permanent piles will be three feet or less in diameter, resulting in a relatively low level of energy needed to drive them into the substrate. In addition, the sandy soil type at the project site would be considered a weak or soft soil which generates less resistance to piles, resulting in lower vibration levels near the source than in a more competent soil. However, pile driving in the soils at Tenmile River would result in vibrations that, while continuing to decrease as the vibration moves away from the source, would remain somewhat higher at distances further away from the source than would occur in competent soil.

Based on the results of studies on the Noyo River, noise levels probably would not exceed 190 dB at the Tenmile site except in the immediate vicinity of the piles. Assuming there is some similarity between salmonids and non-salmonid fish species as to how they would react to pile driving (given other considerations identified in earlier sections of this Biological Opinion), there is a likelihood that the proposed pile driving would result in actual death or injury of gobies through barotrauma. For purposes of this consultation, the Service assumes that barotrauma injury to gobies would be limited to an area within 10 m (32.8 ft) of piles driven in the water. Considering the full 335 temporary piles likely to be driven, approximately 10.5 ha (26.0 ac) would be subject to an elevated sound level resulting in a risk of barotrauma to gobies.

In addition to barotrauma effects, disturbance to gobies could occur as a result of peak noise levels below 190 dB, in the form of gobies moving away from preferred breeding sites or even abandoning established breeding burrows. For purposes of this consultation, the Service assumes that all gobies within 10 m (32.8 ft) would be subject to sound levels approaching 190 dB, and would have a likelihood of being disturbed by elevated sound levels in the water. Considering the full 335 temporary piles likely to be driven, the entire area covered by temporary piles and cofferdam sheet piles, this same 10.5 ha (26.0 ac), would be subject to a sound level resulting in a risk of disturbance to breeding gobies.

In this analysis, each driven pile is considered an independent event, since there is no information indicating the precise pattern of when piles may be driven within the total array of piles. Gobies may move about within the estuary between breeding attempts, so even short delays between driven piles may result in gobies moving into the impact area independent of pile driving at adjacent pile locations (for piles not within coffer dams). Further, pelagic juveniles may move into the impact area of individual piles subject to the whims of current flow during their pelagic stage. Whereas this interpretation of potential impacts may be somewhat conservative, the Service feels that this is a reasonable worst case scenario for determining the extent of effects of barotrauma for this species under project circumstances.

Installation of the trestle and falsework for the new bridge can be constructed between June 15 and October 31 of the first year of construction. Approximately 15 piles can be driven per day and about 5 hours of an 8-hour day would be spent driving the 15 piles. Therefore, it would take an estimated 80 hours of actual driving time to construct the trestle and falsework piles for the new bridge between June 15 and October 31. The 80 hours represents 2.4 percent of the total time period of in-water work.

Approximately 2 hours of actual pile driving would be needed to construct each cofferdam to be used when the permanent piles are driven. Thus, it will take 6 hours of pile driving to construct all 3 cofferdams in the river. This work will occur between June 15 and October 31 of the first year. The 6 hours represents 0.2 percent of the period of in-water work. It will take an estimated 33 hours of actual driving time to construct the 98 trestle and falsework piles for the demolition of the old bridge. If installing the falsework and trestle piles for the demolition of the existing bridge occurs during the first year, the work will represent one percent of the period of in-water work (June 15 through October 31). If the work occurs during subsequent years, the work will represent 3 percent of the period of in-water work (September 15 through October 31). Each of the five cofferdams required to remove the piers of the existing bridge will take 2 hours of actual pile driving to construct. Approximately 10 hours of pile driving will be required to construct the 5 cofferdams in the river. If this work occurs during the first year, it will represent 0.3 percent of the period of in-water work between June 15 and October 31. If the work occurs during subsequent years, the work will represent 0.9 percent of the period of in-water work September 15 through October 31.

The preceding information suggests that actual installation of the temporary piles for both the new and old bridges will occur over a relatively short period of time when considering the total amount of time available during the goby's breeding season. Although gobies may be breeding throughout the summer and into fall, installation of the temporary piles, which will occur between June 15 and October 31 during the first year of construction, will avoid part of the spring peak breeding time. During subsequent years of construction, installation of temporary piles will be limited to September 15 to October 31, later in the breeding season. The work would occur during a short portion of the breeding season but would fall outside of the primary spring and summer breeding time.

The duration of adverse effects to the species would be substantially greater than suggested by the short time period of actual pile driving. Should gobies, including adults, juveniles or eggs, be subject to barotrauma injury or mortality, even over a very short period of time, these effects could still result in lost individuals or lost reproductive efforts. Disturbance to adults resulting in movement away from breeding burrows, even for short periods of time, likely results in lower survival of eggs and juveniles, or in lost reproductive efforts for a complete breeding season. Therefore, the Service assumes that any injury, mortality, or disturbance resulting from pile driving and its associated activities would be expressed in terms of lost individuals and lost reproductive effort for the duration of the breeding season. The Service recognizes, however, the benefits of reducing the overall risk to the species by measures incorporated into the project to minimize adverse impacts to the species, including the specification of timing for pile driving to later in the known breeding season of the species.

Effects due to vibration include collapse of breeding burrows, potentially smothering eggs or trapping larval young. The extent of this effect is not well understood, but the Service assumes that this effect could mimic the distance at which vibrations from similar activities are known to affect human structures, approximately 7.6 m (25 ft). For purposes of this consultation, the Service assumes that all goby burrows within 7.6 m would be subject to vibrations that could result in damage due to collapse. Considering the full 335 temporary piles likely to be driven, the entire area covered by temporary piles and cofferdam sheet piles, approximately 10.5 ha (26.0 ac), would be subject to vibration resulting in a risk of damage to breeding burrows.

Gobies breeding in the area of pile driving potentially could be injured or killed by being crushed or struck by the piles, as would larval young or eggs within the burrow. This could occur under any of the piles to be driven in the water, for a distance of approximately 1.0 m (3.3 ft) for each pile. The area affected over the full complement of 335 piles would be approximately 0.11 ha (0.26 ac).

Gobies, their larval young, or eggs could also be killed or injured by activities associated with the barge and boats, as a result of direct striking (such as from the boat screw) or crushing if the boat or barge were to ground. Gobies may be temporarily displaced as a result of noise and vibration associated with barge operation during pile driving. This disturbance could occur over an area of up to 5.3 ha (13 ac), and would last for the period of time during which active pile driving and boat use would occur. This time period is anticipated to be 12 to 15 days boat use.

Permanent pier construction cannot begin until a portion of the trestle and each cofferdam is assembled. Driving of the permanent piles may begin as early as late summer of the first year, although it is anticipated that most of the permanent piles will be installed in the fall and winter months. Work on the permanent piles will extend into spring and the following summer if additional time is required.

Peak noise levels for driving the permanent piles are not expected to exceed 190 dB as a result of working inside a dewatered cofferdam. Since the dewatered cofferdam attenuates the sound level

substantially, it is unlikely that noise impacts resulting from driving the permanent piles would adversely affect the tidewater goby through direct injury or mortality. Vibration and noise levels are expected to be low outside the cofferdam, but may still result in some damage to or loss of burrows through collapse. Sound levels approaching 190 dB could result in changes in behavior to gobies or damage to burrows, as already described for driving of temporary piles. Since these effects would occur in association with the cofferdams, no additional effects over and above those associated with temporary pile and cofferdam construction are anticipated. That is, the effects resulting from construction of cofferdams already account for loss of gobies and potential reproduction for up to 10 m from the cofferdams. Effects associated with driving of permanent piles would not alter that level of effect.

Alternative construction techniques that would alter the timing and methodology of pile driving were considered during project design. Each was considered in relation to its feasibility and the likelihood that it would result in a lower level of adverse effects to gobies and other listed species. They are described in detail in the biological assessment and will not be repeated here.

Listed coho salmon migrate through the action area during both adult and juvenile life stages, but are not known to breed there. Their use of the river in the action area occurs primarily during mid- to late-late spring (juvenile out-migration), and mid- to late-fall (return of adult spawners). The proposed timing of pile driving in the river was determined to be the best feasible alternative to accommodate the somewhat complementary use periods of the action area by both coho salmon and tidewater gobies.

Alternatives to the proposed construction methods and timing were found to be infeasible, or to provide no measurable reduction in adverse effects to gobies and coho salmon. After reviewing the options to complete the project, it was determined that the proposed schedule and methods, to begin the permanent pile driving in summer, provided the best balance to minimize overall impacts to a reasonable extent to the tidewater goby and coho salmon.

Direct Effects During Fish Rescue

An effect of the fish rescue during construction of the attenuation systems is the possible entrapment of tidewater gobies in the cofferdams. During dewatering, any fish present in these enclosures will be captured, as feasible, and relocated upstream. The fish rescue operation will include netting and relocating fish remaining in the dewatered structures. This action would constitute injury and possibly result in mortality due to handling shock. Due to its small size and its benthic life form, it is likely that some gobies will not be captured and will die during dewatering of the cofferdams. This is particularly true for juveniles, which are planktonic during the first few weeks to months of life. Double screening of pumps and other measures are expected to substantially reduce the risk of injury and mortality to gobies during dewatering. However, it will be impossible to capture and safely move every goby using feasible, standard methods. It is also likely that some planktonic juveniles and adults may be inadvertently killed by entrapment in equipment used in the dewatering operation. Further, it will not be possible to find and relocate nesting burrows in the substrate; any eggs within those breeding burrows are

expected to be killed. The area of this effect is anticipated to be less than 0.1 ha (0.25 acre) in total for the eight cofferdams to be used for pier construction on the new bridge and pier removal on the old bridge. This effect is expected to occur during a single breeding season.

Direct Effects During Pile Driving on Land

Construction of the Noyo River Bridge replacement project in Mendocino County was examined to assess the effect that driving piles on land immediately adjacent to aquatic habitats could have on salmonids by changes in sound pressure in adjacent river habitat. It was determined that pile driving on land had no effect on fish, primarily since the soils prevented the sound waves from traveling into the aquatic environment. Based on this information, pile driving on land at the Tenmile River Bridge site to construct the four bents and associated trestle and falsework will not affect the tidewater goby through barotrauma. It is also unlikely that goby burrows will be adversely affected by vibration from piles driven on land, since these piles are far enough from the aquatic habitat to attenuate vibration levels to a safe amplitude.

Direct Effects During Removal of Temporary Piles

Removal of the temporary piles used during the construction of the new bridge and the removal of the old bridge may occur at any time during the year. The piles will be vibrated out. There may be some minor vibration and increased turbidity immediately adjacent to the piles. Both are expected to be localized and short in duration, although silting in of burrows or collapse of burrows could occur should they be in immediate proximity to the temporary piles. The level of effect from vibration and disturbance is expected to be similar to but somewhat less in extent than during the driving of the piles earlier in the project implementation. Elevated noise as a result of vibration removal of the piles is not expected to result in barotrauma, but could result in a low level of disturbance over approximately 1.6 ha (4.0 ac) for part of one breeding season.

Direct Effects During Removal of the Superstructure

Removal of the superstructure for the portion of the existing bridge that occurs over the river will occur by dropping portions of the superstructure onto a temporary solid platform built on temporary piles. The platform will be installed under the bridge, similar to how the trestle will be installed for the construction of the new bridge. The platform will extend the full length and width of the section of the bridge that occurs over water. It will serve as a protective cover to minimize any dust or debris falling below into the waterway. This method is expected to minimize adverse effects to the goby, although small and likely insignificant amounts of debris are likely to fall into the water and potentially affect gobies and their habitat.

Direct Effects During Removal of Permanent Piers

Cofferdams, casings or similar containment measures will be placed around the footing of each of five piers on the existing bridge, approximately three feet below grade to control turbidity around the piles. The piers will then be removed below riverbed level to a depth of approximately 1 m (3.3 ft). Noise levels would be similar to those estimated for trestle and falsework construction for both the new and existing bridges. Therefore, the installation of the containment structures for removal of the old permanent piers will have effects similar to those anticipated for similar activities to construct the new permanent piers, and are addressed there.

Direct Effects from Habitat Removal

Within the action area, goby habitat includes all suitable habitat within the stretch of the river from 14.5 m (48 ft) downstream of the existing bridge to the proposed launch point for the barge approximately 420 m (1,380 ft) upstream of the existing bridge, for a total of approximately 5.3 ha (13 ac). This estimate translates to approximately 53,000 sq. m (570,000 sq. ft). The habitat is considered to be inclusive of the water column, the river substrate, and the aquatic vegetation present in the river.

Temporary, adverse effects to the habitat will occur during the installation and later removal of the temporary piles during the construction of the new bridge and demolition of the existing bridge. These adverse effects would be in the form of physical alteration of the stream substrate during driving and removal of the piles, as well as through a temporary reduction in area available for gobies to forage and breed. The temporary piles will remain in the river until project completion, reducing the area for gobies to inhabit during the life of the project. The area covered by the temporary piles will be small compared to the remainder of the substrate available to the goby, both in the action area as well as in the contiguous suitable habitat throughout the estuary. Based on information provided in the biological assessment, temporary impacts to goby habitat would be to approximately 502.8 sq. m (5,412 sq. ft). This translates to approximately one percent of the suitable habitat in the action area, and to a far smaller percentage of suitable habitat available to the species within the estuary as a whole.

The removal of the temporary piles and cofferdams will result in holes remaining in the substrate. Based on information provided in the biological assessment, it is anticipated that these holes will fill in relatively quickly and naturally, based on results of a visual inspection of holes remaining in the river from the geotechnical drilling. This visual inspection occurred on October 2, 2003, 1.5 months after the geotechnical drilling took place. The results of that inspection, which supports this analysis of effects, is described in detail in the biological assessment and will not be repeated here. While the holes for the cofferdams and temporary piles will be much larger in size than from the drill holes, it is anticipated that they will be filled by native material during future, natural, high water sediment transport. This recovery of natural river substrate is anticipated to occur within a period of 10 years or less following completion of the project, following a flow event capable of moving fine sediments and sand substrate.

Once this recovery occurs, the project is likely to result in a slight increase in area of breeding and foraging habitat, due to the smaller size of the permanent piles on the new bridge in comparison to the existing bridge. The permanently impacted habitat resulting from the new, smaller piles will be 15.3 sq. m (164.7 sq. ft). The piles supporting the existing bridge cover an area of 23.3 sq. m (250.8 sq. ft). Therefore, upon completion of the project, gobies will benefit from a net gain of 8 sq. m (86 sq. ft) of river substrate over current conditions in which to forage and breed.

Direct Effects from Habitat Degradation

Turbidity may increase as a result of the installation and removal of the temporary piles and the construction, dewatering, and removal of cofferdams. This increase in turbidity will be localized, of short duration, and controlled within specified limits (see Description of the Proposed Action).

Placement of the temporary piles, including cofferdam sheet piles, will occur under water and will result in some movement of river substrate adjacent to each pile and cofferdam. The removal and stockpiling of this material is not logistically or economically feasible, and the effects are expected to be relatively minor.

The use of a barge and boats may degrade goby habitat by increasing suspended sediments and damaging aquatic vegetation. This loss would occur during part of the summer breeding season during the first year and during a small portion of the breeding season the following years. Fluctuations in water levels, such as from a breeching of the estuary sand spit, during the period of barge use may cause the barge to temporarily touch bottom, resulting in loss of burrows and potential crushing of individuals over an area of approximately 75 sq. m (807 sq. ft). The Service anticipates the loss of reproductive effort for that breeding season over that area. A total of 75 sq. m may be modified by each barge grounding. It is anticipated that barge grounding would not result in substantial loss or modification of stream substrate.

The proposed action is not anticipated to result in significant changes to the composition of river substrate, water quality, or aquatic vegetation. Measures implemented to contain sediment during cofferdam dewatering, pile driving, and demolition of the existing bridge are anticipated to result in insignificant changes to these habitat components.

Summary of Direct Effects

In summary, injury, mortality, and disturbance resulting from pile driving and its associated activities would be expressed in terms of lost individuals and lost reproductive effort associated with the specified areas for the duration of the breeding season. Adverse effects to tidewater gobies as a result of pile driving and cofferdam construction and removal include:

- Approximately 10.5 ha (26.0 ac) would be subject to high sound levels during pile driving resulting in a risk of barotrauma to gobies.
- Approximately 10.5 ha (26.0 ac) would be subject to high sound levels during pile driving resulting in a risk of disturbance to breeding gobies.
- Approximately 1.6 ha (4.0 ac) would be subject to vibration during pile driving resulting in a risk of damage to breeding burrows.
- Approximately 0.11 ha (0.26 ac) would be subject to direct damage or crushing by the placement of temporary piles and cofferdam sheets.
- Gobies may be temporarily displaced as a result of noise and vibration associated with barge operation during pile driving, over an area of up to 5.3 ha (13 ac).

- At least some gobies, including adults, larval juveniles, and eggs, are anticipated to be injured or killed during dewatering of seven cofferdams, over an area of 0.1 ha (0.25 ac) or less for one or two breeding seasons.
- Approximately 1.6 ha (4.0 ac) would be subject to vibration during pile removal resulting in a risk of disturbance to breeding gobies should that removal occur during any breeding season.
- A small amount of debris is likely to fall into the water during bridge demolition, but the potential effect on gobies and their habitat is expected to be insignificant.
- The installation of the containment structures for removal of the old permanent piers will have effects similar to those anticipated for similar activities to construct the new permanent piers.
- Approximately 502.8 sq. m (5,412 sq. ft) of suitable goby habitat would be temporarily removed during pile installation, but is expected to fully recover within 10 years or less.
- Should the barge temporarily touch bottom, it would result in loss of burrows or crushing of individual gobies over an area of approximately 75 sq. m (807 sq. ft) for each grounding.
- Upon completion of the project, gobies will *benefit* from a net gain of 8 sq. m (86 sq. ft) of river substrate in which to forage and breed.

Indirect Effects

Indirect effects are caused by or result from the proposed action, are later in time, and are reasonably certain to occur. Indirect effects may also occur outside of the area directly affected by the action. We do not anticipate that the proposed project would have indirect effects on the goby that are not already likely to occur as a result of the existing structure. The project is not anticipated to affect future use of the Park or estuary, and would not significantly alter future habitat function in any area not already affected by the existing bridge.

Effects of Interrelated and Interdependent Actions

An interrelated activity is one that is part of the proposed action and depends on the proposed action for its justification. An interdependent activity is one that has no independent utility apart from the action under consideration. For the purposes of this consultation, we have determined that there are no interrelated and interdependent actions associated with the proposed action, the replacement of the highway bridge across Tenmile River.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this Biological Opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Cumulative effects for this action that would affect tidewater goby include all other in-channel creek and river activities; lagoon breaching; toxic spillage into coastal creeks, rivers, and lagoons; and introduction of exotic species, including other species of goby, that compete with and prey on tidewater goby. Many of the actions affecting habitat for the goby in Mendocino County will require involvement of the Army Corps of Engineers or the FHWA, and would be subject to section 7 of the Act. The Service is not aware of any future State, Tribal, local of private actions within the project area that would affect the tidewater goby.

Conclusion

After reviewing the current status of the tidewater goby, the environmental baseline for the action area, the effects of the FHWA's proposed replacement of the Tenmile River bridge, and the cumulative effects, it is the Service's Biological Opinion that the FHWA action, as proposed, is not likely to jeopardize the continued existence of the tidewater goby.

This conclusion is based on: (1) the small spatial scale of potential project effects in relation to the current population distribution of the species in the Tenmile River estuary; (2) the short-term nature of most potential effects on goby numbers and reproduction, over parts of up to three breeding seasons; (3) the potential for natural restoration of the affected habitat in less than 10 years, and likely much sooner; and, (4) the conservation measures incorporated into the project to avoid and minimize adverse effects on goby numbers, distribution, and reproduction. These avoidance and minimization measures require operational restrictions, including the seasonal timing of pile driving and use of sound attenuation measures, to minimize effects on tidewater goby.

INCIDENTAL TAKE STATEMENT

Section 9(a)(1) of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened fish and wildlife species without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this Incidental Take Statement.

The measures described below are non-discretionary, and must be implemented by the FHWA so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply. The FHWA has a continuing duty to regulate the activity covered by this incidental take statement. If the FHWA (1) fails to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

Sections 7(b)(4) and 7(o)(2) of the Act generally do not apply to listed plant species. However, limited protection of listed plants from take is provided to the extent that the Act prohibits the removal and reduction to possession of Federally listed endangered plants or the malicious damage of such plants on areas under Federal jurisdiction, or the destruction of endangered plants on non-Federal areas in violation of State law or regulation or in the course of any violation of State criminal trespass law.

Amount or Extent of Take of Tidewater Goby

The Service anticipates that incidental take of tidewater goby will occur, but will be difficult to quantify because: (1) gobies are small, difficult to census, and mobile, (2) the understanding of the species' estuarine habitat, and their interactions with goby survival and productivity, is incomplete, (3) its annual life history makes detection difficult, (4) the precise effects of barotrauma from pile driving and other impacts is poorly understood at this time, and (5) the available information concerning goby habitat requirements, behavior, and abundance is limited. Therefore, we have estimated the take of tidewater goby to be an undetermined number of gobies associated with suitable habitat in Tenmile River that would be removed or degraded by the proposed action, or that would be subject to adverse effects from barotrauma and vibration associated with project activities. We have also included in our estimate such take that would result from injury or mortality of gobies or their eggs due to direct contact with construction equipment, materials, or incidental debris. This take is further described in the following sections.

Harassment

Take will occur in the form of harassment by displacement of an undetermined number of individuals by pile driving activities, including access via motorized barge, over an area of up to 15.8 ha (39.0 ac). The greatest risk of take would occur within the immediate vicinity of temporary piles, cofferdams and permanent piles necessary to construct bridge piers and falsework, estimate to be approximately 10.5 ha (26.0 ac). This harassment would be the result of elevated sound levels and vibration causing gobies to permanently or temporarily move away from breeding sites, including active nest burrows. These activities, and the take associated with them, are expected to occur over a single or multiple breeding seasons, likely during the period June 15 to October 31 of the first year of construction, and during the period September 15 to October 31 in up to two subsequent years.

Harm

Take of an undetermined number of individuals or eggs will also occur in the form of harm by localized habitat modification near pile driving sites, including physical displacement of habitat by the piles and cofferdams, effects on water quality due to sediment disturbance, and anchor use. These activities, and the take associated with them, are expected to occur for up to three years, and is expected to affect approximately 502.8 sq. m (5,412 sq. ft) of habitat. Harm to approximately 75 sq. m (807 sq. ft) of potential habitat may occur should unexpected shallow water conditions result in temporary grounding of the pile driving barge. This harm is anticipated to last for less than one full breeding season. Harm is also expected to occur on approximately 1.6 ha (4.0 ac) subject to vibration from pile driving resulting in damage to burrows and eggs, and from temporary alteration of habitat during pile removal.

Direct Injury or Death

The project includes a number of measures designed to avoid and minimize mortality of the goby. Nonetheless, take in the form of mortality of an undetermined number of individuals may occur due to pile driving activities, primarily in the event that adults, juveniles or nest burrows with eggs occur in the immediate vicinity of the piles. Injury or death can occur from the pile or construction equipment striking an individual. This form of take is likely to occur over an area of approximately 0.11 ha (0.26 ac) of suitable habitat for up to one breeding season.
Take due to direct injury or death may also result from collapse of occupied burrows as a result of vibration during pile driving and pile removal. This form of take may occur for up to one breeding season over an area of up to 1.6 ha (4.0 ac).

Injury or death could also result from barotrauma if gobies or their breeding burrows are located immediately adjacent to piles. This take is of gobies associated with approximately 10.5 ha (26.0 ac) of suitable habitat.

Gobies may be injured or killed during draining of cofferdams, as a result of water pumping, desiccation, or removal to other suitable habitat. This take would occur in association with up to 7 cofferdams, and would occur once for each cofferdam over two breeding seasons.

Effect of the Take

In the accompanying Biological Opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize the impact of incidental take on the tidewater goby:

1. Minimize and avoid harm, harassment, and mortality of goby on Tenmile River.
2. Minimize harm to gobies during dewatering of the pier cofferdams and the capture and relocation of fish outside the cofferdams.

3. Minimize destruction or degradation of goby habitat on Tenmile River.
4. Avoid take of any and all listed species that may occur in or near the four additional and as yet unsurveyed disposal sites included in recent revisions to the proposed project.

Terms and Conditions

To be exempt from the prohibitions of section 9 of the Act, the FHWA must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are nondiscretionary.

To implement reasonable and prudent measure 1, the FHWA shall fully implement the conservation measures as described above under Project Description.

To implement reasonable and prudent measure 2, FHWA shall ensure that a qualified fisheries biologist is present and shall oversee all dewatering of the cofferdams and capture and relocation of fish from within the cofferdam. To be fully qualified, the fisheries biologist must possess a section 10(a)(1)(A) recovery permit issued by the Service specifically for the tidewater goby, which authorizes the biologist to conduct such activities at the site.

To implement reasonable and prudent measure 3, the FHWA shall fully implement the conservation measures as described above under Project Description.

To implement reasonable and prudent measure 4, FHWA shall survey and review as necessary any additional disposal sites proposed for use on this project including, but not limited to, the four disposal sites identified in the project description revised in the April 2006 addendum to the biological assessment. In addition to plant and wetland considerations, FHWA should determine if noise disturbance associated with project use of the disposal site may affect listed species in the vicinity. Should this survey and review indicate that listed species will be affected by the use of one or more of these disposal sites, FHWA shall reinitiate consultation with the Service prior to the approval or use of such disposal sites.

Reporting Requirements

Any dead or injured listed species must be reported to the Service's Law Enforcement Division at (916) 979-2987, as soon as possible, and turned over to the Law Enforcement division or to a game warden or biologist of the Department of Fish and Game for care or analysis. The Service is to be notified in writing within three days of the accidental death of, or injury to, any listed species as a result of the project, or of the finding of any dead or injured listed species during implementation of the proposed action. Notification must include the date, time, and location of the incident or discovery of a dead or injured endangered or threatened species, as well as any pertinent information on circumstances surrounding the incident or discovery. The Service contact for this written information is the Field Supervisor at (707) 822-7201.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of ESA directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities that can be implemented to further the purposes of the Act, such as to preserve endangered species habitat, to help implement recovery plans, or to development information. The Service provides the following conservation recommendations that the FHWA and Caltrans may wish to consider in the final planning of this action, and in the planning of similar future actions.

1. Survey and monitor populations of tidewater gobies in Tenmile River and other waters having goby habitat in proximity to highways and highway bridges.

2. Assist the Service in implementing the recovery actions outlined in the recovery plan for the Howell's spineflower.

For the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION–CLOSING STATEMENT

This concludes reinitiation of formal consultation on the actions outlined in your August 7, 2002, request. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded, (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Biological Opinion, (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this Biological Opinion, or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have any questions, please contact staff biologist Ray Bosch at (707) 822-7201.

Sincerely,

Acting Signature on File

Michael M. Long
Field Supervisor

36440

cc:
Federal Highway Administration, Sacramento, CA (Attn: Lanh Phan)
California Department of Transportation, District 1, Eureka (Attn: Lena Ashley)
California Department of Transportation, District 1, Eureka (Attn: Lisa Embree)
California Department of Fish and Game, Yountville (Attn: Corinne Gray)
MacKerricher State Park, Mendocino (Attn: Renee Pasquinelli)

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Personal Communications

David Imper; U.S. Fish and Wildlife Service, Arcata, California; March 23, 2005
Gregory Goldsmith, U.S. Fish and Wildlife Service, Arcata; March 24, 2005

RE✓

California Regional Water Quality Control Board
North Coast Region
Beverly Wasson, Chairperson

Alan C. Lloyd, Ph.D.
Agency Secretary

http://www.waterboards.ca.gov/northcoast
5550 Skylane Boulevard, Suite A, Santa Rosa, California 95403
Phone: 1 (877) 721-9203 (toll free) • Office: (707) 576-2220 • FAX: (707) 523-0135

Arnold Schwarzenegger
Governor

August 5, 2005

EXHIBIT NO. 11 (Part 1)
APPLICATION NO.
1-06-022 – CALTRANS
CONDITION COMPLIANCE
CALIF. REGIONAL WATER QUALITY CONTROL BOARD NPDES PERMIT (1 of 26)

Mr. David Melendrez
Department of Transportation
1656 Union Street
Eureka, CA 95501

Dear Mr. Melendrez:

Subject: Coverage under General National Pollutant Discharge Elimination System Permit for Discharges of Groundwater to Surface Water Related to Construction and Subsurface Seepage Dewatering Activities in the North Coast Region (General Permit), Order No. 93-61, NPDES No. CA0024902 and Monitoring and Reporting Program No. R1-2005-0079 - WDID No. 1B05072NMEN.

File: Ten Mile River Bridge Project, Department of Transportation, Route 1 PM 69.4/70.1 Mendocino County

On May 3, 2005, the North Coast Regional Water Quality Control Board (Regional Water Board) received a complete Report of Waste Discharge and the $1,000 fee for discharge of dewatered groundwater associated with the construction of the Ten Mile River Bridge Project on Route 1 PM 69.4/70.1, Mendocino County, California.

Coverage under the General Permit is effective on the date of this letter; a copy of the General Permit is enclosed. Under the General Permit, permittees are required to take on monitoring and reporting responsibilities. These requirements are specified in the enclosed Monitoring and Reporting Program No. R1-2005-0079. Additionally, the Permittee shall complete the project as proposed in the application. If the proposed project is modified, please contact Regional Water Board staff immediately.

If you have any questions, contact Mona Dougherty by phone at (707) 570-3761 or e-mail at mdougherty@waterboards.ca.gov.

Sincerely,

Signature on File

for Catherine E. Kuhlman
Executive Officer

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SEP 29 2006
CALIFORNIA COASTAL COMMISSION

080505_KRO_tmk_TenMileRiverBridge_NPDESLetter

Certified Return Receipt Requested

Enclosures: General Waste Discharge Requirements Order No. 93-61
Monitoring and Reporting Program No. R1-2005-0079

California Regional Water Quality Control Board
North Coast Region

MONITORING AND REPORTING PROGRAM
NO. R1-2005-0079

FOR

California Department of Transportation
Ten Mile River Bridge Replacement Project
Route 1 PM 69.4/70.1

Mendocino County

MONITORING

Wastewater

The effluent from dewatering activities shall be monitored for the following:

Parameter	Units	Type of Sample	Sampling Frequency[1]
Flow	gals/day	meter	continuous
Turbidity	ntu	grab	daily
Conductivity	micromhos	meter	daily

Receiving Water

The receiving water shall be monitored for the following:

Parameter	Units	Type of Sample	Sampling Frequency[1]
Turbidity	ntu	grab	daily
Conductivity	micromhos	meter	daily

REPORTING

Monitoring reports shall be submitted such that they are received in the Regional Water Board office no later than the last day of the following month after the completion of the project's dewatering activities. Monitoring reports shall contain all monitoring results that were obtained during the project duration. In reporting the monitoring data, the discharger shall arrange the data in tabular form so that the date and monitoring information are readily discernible. The data shall be summarized in such a manner as to illustrate clearly the compliance with Waste Discharge Requirements. The monitoring report shall be submitted with a letter of transmittal. This letter shall include the following:

1. Identification of facility: Name, address, WDID number;

2. Date of report and monitoring period;

[1] When discharge activities are occurring.

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3. Identification of all violations of effluent limitations or other discharge requirements found during the monitoring period;

4. Details of the violations: parameters, magnitude, test results, frequency, and dates;

5. The cause of the violation;

6. Discussion of corrective actions taken or planned to resolve violations and prevent recurrence, and dates or time schedule of action implementation;

7. Authorized signature; and

8. Certification statement: "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature on File

Ordered by _____

for Catherine E. Kuhlman
Executive Officer

August 5, 2005

Construction Dewatering

California Regional Water Quality Control Board
North Coast Region

ORDER NO. 93-61
NPDES PERMIT NO. CA0024902

GENERAL NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT
WASTE DISCHARGE REQUIREMENTS

FOR

DISCHARGES OF GROUNDWATER TO SURFACE WATER
RELATED TO
CONSTRUCTION AND SUBSURFACE SEEPAGE DEWATERING ACTIVITIES
IN THE NORTH COAST REGION

The California Regional Water Quality Control Board, North Coast Region (hereinafter the Board), finds that:

1. The September 22, 1989, Memorandum of Agreement between the U.S. Environmental Protection Agency (hereinafter EPA) and the State Water Resources Control Board (hereinafter State Board) authorized and established procedures for the State to issue general National Pollutant Discharge Elimination System (NPDES) permits pursuant to 40 CFR 122.28 and 122.44.

2. 40 CFR 122.28 provides for the issuance of general permits to regulate a category of point sources if the sources: a) involve the same or substantially similar types of operations; b) discharge the same type of wastes; c) require the same type of effluent limitations or operating conditions; d) require similar monitoring; and, e) are more appropriately regulated under a general permit rather than individual permits.

3. Existing and future discharges of groundwater to surface waters from construction dewatering and subsurface seepage dewatering: a) result from similar operations - all involve extraction and discharge of groundwater; b) are the same type of waste - all are groundwater which may or may not contain pollutants; c) require similar effluent limitations for discharges to the same receiving waters; d) require similar minimum frequency of monitoring - annually; and , e) are determined to be more effectively regulated with general permits rather than individual permits. This Order therefore establishes requirements to regulate discharges of groundwater containing pollutants to surface waters under the jurisdiction of this Regional Board.

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4. General waste discharge Requirements and NPDES permits will enable the Regional Board to expedite processing of requirements, simplify the application process for dischargers, better utilize limited staff resources, and avoid the expense and time involved in repetitive public noticing, hearings, and permit adoptions.

5. The Board adopted Water Quality Control Plans for the Klamath River Basin (1A) and the North Coastal Basin (1B) on March 20, 1975. The Klamath River Basin Plan (1A) was combined with the North Coastal Basin Plan (1B) to form the Water Quality Control Plan for the North Coast Region. The Plan for the North Coast Region was adopted by the Board on April 28, 1988 and approved by the State Water Resources Control Board on November 15, 1988. The Plan includes water quality objectives, implementation plans for point source and nonpoint source discharges and statewide plans and policies. The State Water Resources Control Board adopted the Inland Surface Waters Plan and the Enclosed Bays and Esturaries Plan on April 11, 1991.

6. This permit establishes effluent limitations for toxic substances as specified in Tables 1 and 2 of the Inland Surface Waters Plan.

   The permittee is required to monitor the discharge for those substances likely to be in the permittee's waste stream as specified in the attached Monitoring and Reporting Program. This determination is based on a careful review of laboratory analyses of the discharge and descriptions of the dewatered area.

   The permittee has certified that certain Table 1 and 2 substances are not in the waste stream, that no source has been identified which would likely result in the presence of such substances in the waste stream, and that no change has occurred that could cause such substance(s) to be present in the waste stream.

7. The permittee has submitted a report of waste discharge, an appropriate fee, and given notice of the intent to comply with the terms and conditions of this permit.

8. The beneficial uses of waters of the region include:

   a. municipal and domestic supply
   b. agricultural supply
   c. industrial supply
   d. groundwater recharge
   e. freshwater replenishment
   f. navigation
   g. hydropower generation
   h. water contact recreation
   i. non-contact water recreation
   j. ocean commercial and sport fishing
   k. warm freshwater habitat
   l. cold freshwater habitat

m. preservation of areas of special biological significance
n. saline water habitat
o. wildlife habitat
p. preservation of rare and endangered species
q. marine habitat
r. fish migration
s. fish spawning
t. shellfish harvesting

9. Beneficial uses of areal groundwaters include:

a. domestic water supply
b. agricultural water supply
c. industrial supply

10. Effluent limitations, and toxic and pretreatment effluent standards established pursuant to Sections 208(b), 301, 302, 303(d), 304, 306, 307, and 403 of the Clean Water Act and amendments thereto are applicable to the permittee.

11. On October 28, 1968, the State Water Resources Control Board adopted Resolution 68-16 "Statement of Policy with Respect to Monitoring High Quality of Waters in California", Which requires the application of best practicable treatment or control discharge to maintain high quality of receiving waters.

12. Section 301(b)(2) of the Clean Water Act requires that all NPDES permits prescribe the application of best available technology economically achievable in the determination of technology-based effluent limitations.

13. The requirements contained in this Order were established by considering all the water quality control policies, plans, and regulations mentioned above and will protect and maintain the beneficial uses of the receiving waters.

14. The issuance of general waste discharge requirements for the above described discharges is exempt from the provisions of Chapter 3 (commencing with Section 21100) of Division 13 of the Public Resources Code in accordance with Water Code Section 13389. The discharges that will be authorized under these general waste discharge requirements are not "new sources" as defined in 33 U.S.C., Section 306 and 40 CFR, Part 122.2.

Moreover, as an activity for protection of the environment, in accordance with Title 14, California Code of Regulation, Section 14308, the issuance of general waste discharge requirements is exempt from the provisions of Chapter 3, Division 13, Section 21100, et seq.

15. The Board, in a public meeting, heard and considered all comments pertaining to the discharge. 6 of 26

16. This Order will serve as a National Pollutant Discharge Elimination System Permit pursuant to Section 402 of the Clean Water Act, or amendments thereto, and will take effect at the end of ten days from the date of adoption by the Board.

THEREFORE, IT IS HEREBY ORDERED that the permittee, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, and the provisions of the Clean Water Act and regulations and guidelines adopted thereunder, shall comply with the following:

A. ELIGIBILITY

1. Existing and future discharges of groundwater to surface waters resulting from construction dewatering and for subsurface seepage dewatering and similar operations may be eligible for this permit.

2. When an individual NPDES permit with more specific requirements is issued to a discharger, the applicability of this general permit to the individual NPDES permittee is automatically terminated on the effective date of the individual permit.

B. AUTHORIZATION

To be authorized to discharge under this Order, the discharger must submit a Report of Waste Discharge and an application for a NPDES permit (hereinafter Report of Waste Discharge) in accordance with the requirements of Part C of this Order. Upon receipt of the Report of Waste Discharge, the Executive Officer shall determine the applicability of this Order to such a discharge (including an evaluation that the discharge will result in attainment of the objectives set forth in the water quality control plans discussed in Finding Nos. 5 and 6). If the Executive Officer so finds, he shall notify the discharger that its discharge is authorized under the terms and conditions of this Order and prescribe the appropriate monitoring and reporting program.

For new discharges, the discharge shall not commence until receipt of the Executive Officer's written determination.

C. REPORT OF WASTE DISCHARGE

1. Deadline for Submission

a. Existing dischargers who intend to obtain coverage under this Order shall file a Report of Waste Discharge within 90 days of the effective date of this Order.

b. New discharges shall file a Report of Waste Discharge at least 60 days before start of discharge.

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2. Failure to Submit a Report of Waste Discharge

Dischargers who fail to file a report of waste discharge and discharge pollutants to the waters of the State are in violation of the California Water Code and the Federal Clean Water Act.

3. Alternative Method of Disposal

The Report of Waste Discharge shall be accompanied by a feasibility study of reuse of the groundwater. If reuse is not feasible, the Report of Waste Discharge hasll be accompanied by a description of alternatives for disposal other than to surface waters.

D. DISCHARGE LIMITATIONS

Discharges authorized under this Order shall comply with the following discharge limitations, and additional limitations set forth in Attachment A. In the letter of determination, the Executive Officer shall indicate the discharge limitations in Attachment A applicable to the particular waste discharge.

1. The discharge of groundwater containing constituents in excess of the background level in the receiving water is prohibited.

2. The discharge of any waste not specifically regulated by this Permit is prohibited.

3. Creation of a pollution, contamination, or nuisance, as defined by Section 13050 of the California Water Code (CWC) is prohibited.

4. The discharge from the treatment facility of detectable levels of petroleum, petroleum constituents or volatile halogenated compounds is prohibited.[1]

E. RECEIVING WATER LIMITATIONS

1. The waste discharge must not cause the dissolved oxygen concentration of the receiving water to be depressed below 7.0

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[1]For the purpose of this Permit, levels of detection are as follows:

CONSTITUENT	UNITS	DETECTION LIMIT
Petroleum Hydrocarbons	ug/l	50
Benzene	ug/l	0.5
Toluene	ug/l	0.5
Xylene	ug/l	0.5
Ethylbenzene	ug/l	0.5
Volatile Halogenated Compounds	ug/l	0.5

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mg/l. In the event that the receiving waters are determined to have dissolved oxygen concentration of less than 7.0 mg/l, the discharge shall not depress the dissolved oxygen concentration below the existing level.

2. The discharge must not cause the pH of the receiving waters to be depressed below 6.5 nor raised above 8.5. Within this range, the discharge shall not cause the pH of the receiving waters to be changed at any time more than 0.5 units from that which occurs naturally.

3. The discharge must not cause the turbidity of the receiving waters to be increased more than 20 percent above naturally occurring background levels.

4. The discharge must not cause the receiving waters to contain floating materials, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses.

5. The discharge must not cause the receiving waters to contain taste or odor-producing substances in concentrations that impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin, that cause nuisance, or that adversely affect beneficial uses.

6. The discharge of waste must not cause esthetically undesirable discoloration of the receiving waters.

7. The discharge must not cause bottom deposits in the receiving waters to the extent that such deposits cause nuisance or adversely affect beneficial uses.

8. The discharge must not contain concentrations of biostimulants which promote objectional aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses of the receiving waters.

9. The discharge must not cause the receiving waters to contain toxic substances in concentrations that are toxic to, degrade, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.

10. The discharge must not cause a measurable temperature change in the receiving waters.

11. The discharge must not cause bioaccumulation of pesticide, fungicide, wood treatment chemical, or other toxic pollutant concentrations in bottom sediments or aquatic life to levels which are harmful to human health.

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12. The discharge must not cause the receiving waters to contain oils, greases, waxes, or other materials in concentrations that result in a visible film or coating on the surface of the water or on objects in the water that cause nuisance or that otherwise adversely affect beneficial uses.

13. This discharge must not cause a violation of any applicable water quality standard for receiving waters adopted by the Board or the State Water Resources Control Board as required by the Federal Water Pollution Control Act, and regulations adopted thereunder. If more stringent applicable water quality standards are promulgated or approved pursuant to Section 303 of the Federal Water Pollution Control Act, or amendments thereto, the Board will revise and modify this Permit in accordance with such more stringent standards.

14. The discharge must not cause concentrations of contaminants to occur at levels which are harmful to human health in waters which are existing or potential sources of drinking water.

15. The discharge must not cause concentrations of toxic pollutants in the water column, sediments, or biota that adversely affect beneficial uses.

16. The discharge must not cause acute nor chronic toxicity in the receiving waters.

F. SOLIDS DISPOSAL

1. This Permit does not authorize waste discharge to land. Collected screenings, sludges, and other solids removed from liquid wastes shall be disposed of at a solid waste facility for which waste discharge requirements have been prescribed by a Regional Water Quality Control Board.

G. PROVISIONS

1. Duty to Comply

The permittee must comply with all of the conditions of this Permit. Any permit noncompliance constitutes a violation of the Clean Water Act and the Porter-Cologne Water Quality Control Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. [40CFR122.41(a)]

The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if this Permit has not yet been modified to incorporate the requirement. [40CFR122.41(a)(1)]

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2. Duty to Reapply

This permit expires on five years from the date of issuance. If the permittee wishes to continue an activity regulated by this Permit after the expiration date of this Permit, the permittee must apply for and obtain a new permit. The application, including a report of waste discharge in accordance with Title 23, California Code of Regulations must be received by the Board no later than 60 days prior to the expiration of this permit. [40CFR122.41(b)]

The Regional Administrator of the Environmental Protection Agency may grant permission to submit an application at a later date prior to the permit expiration date; and the Regional Administrator of the Environmental Protection Agency may grant permission to submit the information required by paragraphs(g)(7), (9), and (10) of 40CFR122.21 after the permit expiration date. [40CFR122.21(d)(2)]

3. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Permit. [40CFR122.41(c)]

4. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this Permit which has a reasonable likelihood of adversely affecting human health or the environment. [40CFR122.41(d)]

5. Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with this Permit. Proper operation and maintenance includes adequate laboratory control and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems that are installed by a permittee only when necessary to achieve compliance with the conditions of this Permit. [40CFR122.41(e)]

6. Permit Actions

This Permit may be modified, revoked and reissued, or terminated for cause including, but not limited to, the following:

a. Violation of any terms or conditions of this Permit; or
b. Obtaining this Permit by misrepresentation or failure to

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disclose fully all relevant facts; or

c. A change in any condition that requires either a temporary or a permanent reduction or elimination of the authorized discharge; or

d. A determination that the permitted activity endangers human health or the environment and can only be regulated to acceptable levels by permit modification or termination.

e. A determination that a certification that substances identified in Tables 1 and 2 of the Inland Surface Waters Plan do not occur in the discharge is no longer valid.

The Board may also review and revise this Permit at any time upon application of any person, or on the Board's own motion. [CWC 13263(e)]

If any toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the Clean Water Act for a toxic pollutant which is present in the discharge and that standard or prohibition is more stringent than any limitation on the pollutant to this Permit, this Permit shall be modified or revoked and reissued to conform to the toxic effluent standard or prohibition and the permittee so notified. [40CFR122.41(f)]

The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition. [40CFR122.41(f)]

7. Property Rights

This Permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. [40CFR122.41(g)]

8. Duty to Provide Information

The permittee shall furnish the Board, State Water Resources Control Board (SWRCB), or Environmental Protection Agency (EPA), within a reasonable time, any information which the Board, SWRCB, or EPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Permit or to determine compliance with this Permit. The permittee shall also furnish to the Board, upon request, copies of records required to be kept by this Permit. [40CFR122.41(h)]

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The permittee shall conduct analysis on any sample provided by EPA as part of the Discharge Monitoring Quality Assurance (DMQA) program. The results of any such analysis shall be submitted to EPA's DMQA manager.

9. Inspection and Entry

The permittee shall allow the Board, SWRCB, EPA, and/or other authorized representatives upon the presentation of credentials and other documents as may be required by law, to:

a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this permit;
b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Permit;
c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Permit; and
d. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any locations. [40CFR122.41(i)]

10. Monitoring and Records

a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

b. The permittee shall calibrate and perform maintenance procedures in accordance with manufacturer's specifications on all monitoring instruments and equipment to ensure accurate measurements. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this Permit, and records of all data used to complete the application for this Permit, for a period of at least three years from the date of the sample, measurement, report, or application. This period may be extended by request of the Board, SWRCB, or EPA at any time. All monitoring instruments and devices used by the permittee to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary, at least annually to ensure their continued accuracy.

c. Records of monitoring information shall include:

i. The date, exact place, and time of sampling or measurements;
ii. The individual(s) who performed the sampling or measurements;

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iii. The date(s) analyses were performed;
iv. The individual(s) who performed the analyses;
v. The analytical techniques or methods used; and
vi. The results of such analyses.

d. Unless otherwise noted, all sampling and sample preservation shall be in accordance with the current edition of "Standard Methods for the Examination of Water and Wastewater" (American Public Health Association). All analyses must be conducted according to test procedures under 40 CFR Part 136, unless other test procedures have been specified in this Permit. Unless otherwise specified, all metals shall be reported as total metals. Test fish for bioassays and test temperatures shall be specified by the Board. Bioassays shall be performed in accordance with guidelines approved by the Board and the Department of Fish and Game.

11. Signatory Requirements

a. All permit applications, reports, or information submitted to the Regional Board, State Board, and/or EPA shall be signed by a responsible corporate officer. For purposes of this provision, a responsible corporate officer means:

i. a president, secretary, treasurer, or vice president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions for the corporation; or

ii. the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25 million (in second quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

OR

For a Partnership or Sole Proprietorship, all permit applications, reports, or information submitted to the Regional Board, State Board, and/or EPA shall be signed by a general partner or the proprietor, respectively.

OR

For a Municipality, State, or Other Non-Federal Public Agency, all permit applications, reports, or information submitted to the Regional Board, State Board, and/or EPA shall be signed by either a principal executive officer or ranking elected official. [40CFR122.22(a)]

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b. Reports required by this Permit, other information requested by the Board, SWRCB, or EPA, and permit applications submitted for Group II stormwater discharges under 40CFR122.26(b)(3) may be signed by a duly authorized representative provided:

i. the authorization is made in writing by a person described in paragraph (a) of this provision;

ii. the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company; and

iii. the written authorization is submitted to the Board prior to or together with any reports, information, or applications signed by the authorized representative. [40CFR122.22(b)(c)]

c. Any person signing a document under paragraph (a) or (b) of this provision shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted, is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40CFR122.22(d)]

12. Reporting Requirements

a. Planned changes: The permittee shall give notice to the Regional Board as soon as possible of any planned physical alteration or additions to the permitted facility. Notice is required under this provision only when:

i. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40CFR122.29(b); or

ii. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants

which are subject neither to effluent limitations in the permit, nor the notification requirements under Provision 12 (g).

b. Anticipated noncompliance: The permittee will give advance notice to the Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

c. Transfers: This Permit is not transferable.

d. Definitions: The following definitions shall apply unless specified in this permit;

i. "Daily discharge" means the discharge of a pollutant measured during a calendar day of any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in terms of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the sampling day. For pollutants with limitations expressed in other units of measurement, the "daily discharge" shall be the concentrations of the composite sample. When grab samples are used, the "daily discharge" determination of concentration shall be the arithmetic average (weighted by flow value) of all samples collected during the sampling day.

ii. "Daily average" discharge limitation means the highest allowable average of "daily discharges" over a calendar month, calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month.

iii. "Daily Maximum" discharge limitations means that highest allowable "daily discharge" during the calendar month.

e. Monitoring reports: Monitoring results shall be reported at the intervals specified in the self monitoring program. By January 30 of each year, the permittee shall submit an annual report to the Regional Board. The report shall contain both tabular and graphical summaries of the monitoring data obtained during the previous year. In addition, the permittee shall discuss the compliance record and the corrective actions taken or planned which may be needed to bring the discharge into full compliance with the permit. If the permittee monitors any pollutant more frequently than required by this permit, using test procedures approved under 40 CFR Part 136 or as specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR.

f. Compliance schedules: Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

g. Noncompliance reporting: The permittee shall report any noncompliance at the time monitoring reports are submitted. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times and, if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate and prevent recurrence of the noncompliance.

The following events shall be reported orally as soon as the permittee becomes aware of the circumstances, and the written report shall be provided within five days of that time.

i. Any unanticipated bypass that violates any prohibition or exceeds any effluent limitation in the permit.

ii. Any upset that exceeds any effluent limitation in the permit.

iii. Violation of a maximum daily discharge limitation for any of the pollutants listed by the Board in this Permit.

iv. Any noncompliance that may endanger health or the environment.

The Executive Officer may waive the above-required written report.

h. Other information: Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Board, the permittee shall promptly submit such facts or information. [40CFR122.41(1)]

13. Bypass

The intentional diversion of waste streams from any portion of a treatment facility is prohibited.

14. Upset

In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)]

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15. Enforcement

The Clean Water Act provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Clean Water Act is subject to a civil penalty not to exceed $25,000 per day of violation. Any person who negligently violates permit conditions implementing Sections 301, 302, 306, 307, or 308 of the Act is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment of not more than one year, or both. Higher penalties may be imposed for knowing violations and for repeat offenders. The Porter-Cologne Water Quality Control Act provides for civil and criminal penalties comparable to, and in some cases greater than, those provided under the Clean Water Act.

16. Existing Manufacturing, Commercial, Mining, and Silvicultural permittees

All existing manufacturing, commercial, mining, and silvicultural permittees must notify the Board as soon as they know or have reason to believe that any activity has occurred or will occur that would result in the discharge, on a routine or frequent basis, of any toxic pollutant that is not limited in this Permit, if that discharge will exceed one hundred micrograms per liter (100 ug/l). [40CFR122.42(a)(2)]

17. Availability

A copy of this Permit shall be maintained at the discharge facility and be available at all times to operating personnel.

18. Change in Discharge

In the event of a material change in the character, location, or volume of a discharge, (including any point or nonpoint discharge to land or groundwater) the permittee shall file with this Board a new report of waste discharge at least 180 days before making any such change. [CWC Section 13376]. A material change includes, but is not limited to, the following:

a. Significant change in disposal method, e.g., change from a land disposal to a direct discharge to water, or change in the method of treatment which would significantly alter the characteristics of the waste.

b. Significant change in the disposal area, e.g., moving the discharge to another drainage area, to a different water body, or to a disposal area, significantly removed from the original area, potentially causing different water quality or nuisance problems.

19. Severability

Provisions of these waste discharge requirements are severable. If any provision of these requirements is found invalid, the remainder of these requirements shall not be affected.

20. Monitoring

The Board or SWRCB may require the permittee to establish and maintain records, make reports, install, use, and maintain monitoring equipment or methods (including where appropriate biological monitoring methods), sample effluent as prescribed, and provide other information as may be reasonably required. [CWC Section 13267 and 133834].

The permittee must comply with the Contingency Planning and Notification Requirements Order No. 74-151 and the attached Monitoring and Reporting Program and any modifications to these documents as specified by the Executive Officer. Such documents are attached to this Permit and incorporated herein. The permittee shall file with the Board technical reports on self monitoring work performed according to the detailed specifications contained in any monitoring and reporting program as directed by the Board.

Chemical, bacteriological, and bioassay analyses shall be conducted at a laboratory certified for such analyses by the State Department of Health Services. In the event a certified laboratory is not available to the permittee, analyses performed by a noncertified laboratory will be accepted provided:

a. A quality assurance/quality control program is instituted by the laboratory. A manual containing the steps followed in this program must be kept in the laboratory and shall be available for inspection by staff of the Board. The quality assurance/quality control program must conform to EPA or State Department of Health Services guidelines.

b. The laboratory will become certified within the shortest practicable time if the State certification program is resumed.

Certification

I, Benjamin D. Kor, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, North Coast Region, on May 27, 1993

Signature on File

Benjamin D. Kor
Executive Officer

(NPDES.GEN)

Attachment A

GUIDANCE FOR INLAND SURFACE WATERS PLAN PROVISIONS TO BE INCLUDED IN MONITORING AND REPORTING PROGRAMS ASSOCIATED WITH NPDES PERMITS

Monitoring and Reporting Programs should include the following:

1. Table 1 and 2 substances which need to be monitored in the effluent. Monitoring may also be required to assess compliance with water quality objectives in the receiving water. At a minimum this list should include the substances which are or are likely to be in the permittee's waste stream per finding No. 6 of the permit.

2. Short-term (acute) toxicity test and/or three species critical life stage (CLS) toxicity test for applicable permittees. Table 4 of the Inland Surface Waters Plan and the Enclosed Bays and Estuaries Plan specify the species and test requirements for CLS toxicity tests.

   (The following footnotes should also be specified in regards to the critical life stage tests:)

   * The sensitivity of the test organisms to a referenced toxicant shall be determined concurrently with each CLS bioassay and reported with the test results.

   * Dilution and control waters should be obtained from an unaffected area of the receiving waters upstream of the wastewater outfall. Standard dilution water can be used if the stream segment upstream of the outfall exhibits toxicity greater than 1.0 TUc.

   * Monitoring can be reduced to the most sensitive specifies after (<u>date or condition</u>)

3. Type of sample (grab, composite)

4. Monitoring location

5. Appropriate monitoring frequency

6. Analytical methods to be used. Monitoring data to be reported uncensored with Method Detection Limit (MDL) and Practical Quantitation Limit (PQL) or Limit of Quantitation (LOQ).

   - Aquatic life water quality objectives for cadmium, chromium, copper, lead, nickel, silver, and zinc are based on the acid-soluble fraction. Compliance with these objectives shall be determined using the total recoverable method (or a method approved by the State Board's Executive Director or EPA)

   - For objectives which are hardness- or pH-dependent, specify how to determine ambient water hardness or pH and that those measurements must be included with the results.

   (For Bays and Estuaries dischargers delete need for hardness/pH testing to determine compliance with Effluent Limitations because these limitations are not hardness/pH dependent)

APPENDIX 4

SWRCB Minimum Levels in ppb (μg/L)

The Minimum Levels (MLs) in this appendix are for use in reporting and compliance determination purposes in accordance with section 2.4 of this Policy. These MLs were derived from data for priority pollutants provided by State certified analytical laboratories in 1997 and 1998. These MLs shall be used until new values are adopted by the SWRCB and become effective. The following tables (Tables 2a - 2d) present MLs for four major chemical groupings: volatile substances, semi-volatile substances, inorganics, and pesticides & PCBs.

Table 2a - VOLATILE SUBSTANCES*	GC	GCMS
1,1 Dichloroethane	0.5	1
1,1 Dichloroethene	0.5	2
1,1,1 Trichloroethane	0.5	2
1,1,2 Trichloroethane	0.5	2
1,1,2,2 Tetrachloroethane	0.5	1
1,2 Dichlorobenzene (volatile)	0.5	2
1,2 Dichloroethane	0.5	2
1,2 Dichloropropane	0.5	1
1,3 Dichlorobenzene (volatile)	0.5	2
1,3 Dichloropropene (volatile)	0.5	2
1,4 Dichlorobenzene (volatile)	0.5	2
Acrolein	2.0	5
Acrylonitrile	2.0	2
Benzene	0.5	2
Bromoform	0.5	2
Bromomethane	1.0	2
Carbon Tetrachloride	0.5	2
Chlorobenzene	0.5	2
Chlorodibromo-methane	0.5	2
Chloroethane	0.5	2
Chloroform	0.5	2
Chloromethane	0.5	2
Dichlorobromo-methane	0.5	2
Dichloromethane	0.5	2
Ethylbenzene	0.5	2
Tetrachloroethene	0.5	2
Toluene	0.5	2
trans-1,2 Dichloroethylene	0.5	1
Trichloroethene	0.5	2
Vinyl Chloride	0.5	2

*The normal method-specific factor for these substances is 1, therefore, the lowest standard concentration in the calibration curve is equal to the above ML value for each substance.

Table 2b - SEMI-VOLATILE SUBSTANCES*	GC	GCMS	LC	COLOR
1,2 Benzanthracene	10	5		
1,2 Dichlorobenzene (semivolatile)	2	2		
1,2 Diphenylhydrazine		1		
1,2,4 Trichlorobenzene	1	5		
1,3 Dichlorobenzene (semivolatile)	2	1		
1,4 Dichlorobenzene (semivolatile)	2	1		
2 Chlorophenol	2	5		
2,4 Dichlorophenol	1	5		
2,4 Dimethylphenol	1	2		
2,4 Dinitrophenol	5	5		
2,4 Dinitrotoluene	10	5		
2,4,6 Trichlorophenol	10	10		
2,6 Dinitrotoluene		5		
2- Nitrophenol		10		
2-Chloroethyl vinyl ether	1	1		
2-Chloronaphthalene		10		
3,3' Dichlorobenzidine		5		
3,4 Benzofluoranthene		10	10	
4 Chloro-3-methylphenol	5	1		
4,6 Dinitro-2-methylphenol	10	5		
4- Nitrophenol	5	10		
4-Bromophenyl phenyl ether	10	5		
4-Chlorophenyl phenyl ether		5		
Acenaphthene	1	1	0.5	
Acenaphthylene		10	0.2	
Anthracene		10	2	
Benzidine		5		
Benzo(a) pyrene(3,4 Benzopyrene)		10	2	
Benzo(g,h,i)perylene		5	0.1	
Benzo(k)fluoranthene		10	2	
bis 2-(1-Chloroethoxyl) methane		5		
bis(2-chloroethyl) ether	10	1		
bis(2-Chloroisopropyl) ether	10	2		
bis(2-Ethylhexyl) phthalate	10	5		
Butyl benzyl phthalate	10	10		
Chrysene		10	5	
di-n-Butyl phthalate		10		
di-n-Octyl phthalate		10		
Dibenzo(a,h)-anthracene		10	0.1	
Diethyl phthalate	10	2		
Dimethyl phthalate	10	2		
Fluoranthene	10	1	0.05	
Fluorene		10	0.1	
Hexachloro-cyclopentadiene	5	5		

Table 2b - SEMI-VOLATILE SUBSTANCES*	GC	GCMS	LC	COLOR
Hexachlorobenzene	5	1		
Hexachlorobutadiene	5	1		
Hexachloroethane	5	1		
Indeno(1,2,3,cd)-pyrene		10	0.05	
Isophorone	10	1		
N-Nitroso diphenyl amine	10	1		
N-Nitroso-dimethyl amine	10	5		
N-Nitroso -di n-propyl amine	10	5		
Naphthalene	10	1	0.2	
Nitrobenzene	10	1		
Pentachlorophenol	1	5		
Phenanthrene		5	0.05	
Phenol **	1	1		50
Pyrene		10	0.05	

* With the exception of phenol by colorimetric technique, the normal method-specific factor for these substances is 1000, therefore, the lowest standard concentration in the calibration curve is equal to the above ML value for each substance multiplied by 1000.

** Phenol by colorimetric technique has a factor of 1.

Table 2c – INORGANICS*	FAA	GFAA	ICP	ICPMS	SPGFAA	HYDRIDE	CVAA	COLOR	DCP
Antimony	10	5	50	0.5	5	0.5			1000
Arsenic		2	10	2	2	1		20	1000
Beryllium	20	0.5	2	0.5	1				1000
Cadmium	10	0.5	10	0.25	0.5				1000
Chromium (total)	50	2	10	0.5	1				1000
Chromium VI	5							10	
Copper	25	5	10	0.5	2				1000
Cyanide								5	
Lead	20	5	5	0.5	2				10,000
Mercury				0.5			0.2		
Nickel	50	5	20	1	5				1000
Selenium		5	10	2	5	1			1000
Silver	10	1	10	0.25	2				1000
Thallium	10	2	10	1	5				1000
Zinc	20		20	1	10				1000

* The normal method-specific factor for these substances is 1, therefore, the lowest standard concentration in the calibration curve is equal to the above ML value for each substance.

Table 2d - PESTICIDES – PCBs*	GC
4,4'-DDD	0.05
4,4'-DDE	0.05
4,4'-DDT	0.01
a-Endosulfan	0.02
a-Hexachloro-cyclohexane	0.01
Aldrin	0.005
b-Endosulfan	0.01
b-Hexachloro-cyclohexane	0.005
Chlordane	0.1
d-Hexachloro-cyclohexane	0.005
Dieldrin	0.01
Endosulfan Sulfate	0.05
Endrin	0.01
Endrin Aldehyde	0.01
Heptachlor	0.01
Heptachlor Epoxide	0.01
Lindane(g-Hexachloro-cyclohexane)	0.02
PCB 1016	0.5
PCB 1221	0.5
PCB 1232	0.5
PCB 1242	0.5
PCB 1248	0.5
PCB 1254	0.5
PCB 1260	0.5
Toxaphene	0.5

* The normal method-specific factor for these substances is 100, therefore, the lowest standard concentration in the calibration curve is equal to the above ML value for each substance multiplied by 100.

Techniques:

GC - Gas Chromatography
GCMS - Gas Chromatography/Mass Spectrometry
HRGCMS - High Resolution Gas Chromatography/Mass Spectrometry (i.e., EPA 1613, 1624, or 1625)
LC - High Pressure Liquid Chromatography
FAA - Flame Atomic Absorption
GFAA - Graphite Furnace Atomic Absorption
HYDRIDE - Gaseous Hydride Atomic Absorption
CVAA - Cold Vapor Atomic Absorption
ICP - Inductively Coupled Plasma
ICPMS - Inductively Coupled Plasma/Mass Spectrometry
SPGFAA - Stabilized Platform Graphite Furnace Atomic Absorption (i.e., EPA 200.9)
DCP - Direct Current Plasma
COLOR - Colorimetric

California Regional Water Quality Control Board
North Coast Region
William R. Massey, Chairman

Linda S. Adams
Secretary for Environmental Protection

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Arnold Schwarzenegger
Governor

June 30, 2006

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CALIFORNIA COASTAL COMMISSION

EXHIBIT NO. **11 (Part 2)**
APPLICATION NO.
1-06-022 – CALTRANS
CONDITION COMPLIANCE
CALIF. REGIONAL WATER QUALITY CONTROL BOARD SECTION 401 CERTIFICATION
(1 of 8)

Mr. Charlie Fielder
California Department of Transportation
1656 Union Street
Eureka, CA 95501

Dear Mr. Fielder:

Subject: Issuance of Clean Water Act Section 401 Certification (Water Quality Certification) for the Ten Mile River Bridge Replacement Project, Mendocino County, California

File: Caltrans, Ten Mile River Bridge Replacement Project; WDID No. 1B02207WNME

This Order by the California Regional Water Quality Control Board, North Coast Region (Regional Water Board), is being issued pursuant to Section 401 of the Clean Water Act (33 USC 1341). On June 13, 2005, the Regional Water Board received an application from Ms. Lisa Embree, on behalf of the California Department of Transportation (Caltrans and Applicant), requesting a Clean Water Act, Section 401, Water Quality Certification and Waste Discharge Requirements (Dredge/Fill Projects) for the Ten Mile River Bridge Replacement Project (Project) in Mendocino County. The application and processing fee in the amount of $1,575.00 was received on June 13, 2005. Additional information was received on June 5, 2006, June 28, 2006, and June 29, 2006.

Information describing the project was noticed for public comment for a 21-day period on the Regional Water Board's website on June 9, 2006. No comments were received. The Project causes disturbances to Waters of the United States associated with the Mendocino Coast Hydrologic Unit, Ten Mile River Hydrologic Sub Area No. 113.13.

Project Description: Ten Mile River Bridge (No. 10-0161) is located on State Route 1, a two-lane highway, about 6.3 miles north of the Fort Bragg city limit. Built in 1954, the reinforced concrete structure is approximately 1,352-feet long and 26-feet wide, with two 12-foot lanes, 1-foot shoulders, and 9-inch raised curbs. The superstructure consists of slab T-beam girder spans, with box girder spans over the river. The bridge is supported almost

entirely on timber pile and spread footing foundations. It is the only bridge that provides access across the Ten Mile River in the area.

The Project is needed because an evaluation of the Ten Mile River Bridge concluded that it must be upgraded or replaced to meet current seismic standards. The risk of collapse is considered high, and there is no interim retrofit work that can be done to reduce structural deficiencies of the existing structure. The purpose of the Project is to provide an earthquake-resistant bridge by designing a new concrete bridge capable of resisting a maximum credible earthquake.

The Project will replace the existing bridge with a cast-in-place, pre-stressed concrete box girder bridge on Cast-In-Drilled-Hole (CIDH) (Abutment 1, Pier 2, and Abutment 9) and Cast-In-Place-Steel-Shell (CISS) pile foundation systems. The eight-span structure will be supported by two abutments and seven 2-column piers. Construction of temporary falsework, cofferdams, and trestles will be required for the construction of the new bridge. The bridge will be constructed on an approximately parallel alignment, east of the existing structure, at a variable offset of 49 to 62-feet. The new bridge will be 1480-feet long with a 12-foot wide lane and a 6-foot shoulder on both sides. A separated 5-foot sidewalk will be constructed on the west side of the bridge. Additional work involves constructing a new maintenance pullout near the southwest quadrant of the new bridge; realigning, extending, or replacing ditches and culverts; and installing new bridge approach metal beam guard railing.

An access road and trestle will be constructed north of the haul road on an alignment west of the existing bridge to provide access for construction of ground level and aboveground debris containment structures required for bridge demolition. The trestle will rest on approximately 64 H-piles, and a containment platform under the portion of the bridge over the river will be constructed using approximately 34 H-piles. Piers supporting the existing bridge will be removed to a minimum depth of 2-feet below final grade of the river.

Demolition of the existing bridge will be facilitated by temporary establishment of an access road west of the existing bridge. The access road will begin just south of the haul road and may extend up to 14.5 meters beyond the edge of the bridge's deck, likely transitioning to a trestle to facilitate demolition of the bridge over water. The access road will be constructed by laying down filter fabric over existing wetland vegetation. No vegetation will be removed for the access road. Timber planks will then be laid over the filter fabric for structural support. Minor vegetation removal will be required for removing the existing bridge bents over land. These areas will be revegetated. The trestle for the demolition

of the existing bridge is also subject to work windows and is expected to be built during the 2008 or 2009 season. The area beyond the westerly construction boundary will be fenced as an Environmentally Sensitive Area.

Receiving Water: Ten Mile River, Mendocino Coast Hydrologic Unit, Ten Mile River Hydrologic Sub Area No. 113.13.

Federal Permit: United States Army Corps of Engineers Nationwide Permit 3 and 33 (File Number 22428N).

State and Local Approvals: Caltrans has applied for a California Department of Fish and Game Lake and Streambed Alteration Agreement for the Project.

Filled or Excavated Area: Total Area Impacted: 1.003 acres of Waters of the U.S.
Area Temporarily Impacted: 0.995 acres
Area Permanently Impacted: 0.008 acres

Additionally, 5,573 yd^3 of permanent fill will be added to Waters of the United States and Waters of the State.

Although a greater volume of permanent fill will be added during construction of the new bridge than is removed with the demolition and removal of the old bridge, the new bridge will have a smaller area of permanent impact than the old bridge. The increase in volume of fill is due to the depth of the piers rather than an increase in area of impact.

Compensatory Mitigation: A mitigation plan shall be received in the Regional Water Board office for Executive Officer approval no later than October 31, 2006. The plan shall include the requirements in Additional Condition No. 6 (see section below).

Non-compensatory Mitigation: Non-compensatory mitigation measures have been incorporated into the project to reduce potential impacts to water quality, including erosion and sediment control Best Management Practices (BMPs) to reduce the potential for turbid discharges to surface waters. All BMPs and control measures shall be implemented as described in the project description. A revised revegetation plan, as described in Additional Condition No. 5, shall be received in the Regional Water Board office for Executive Officer approval no later than October 31, 2006.

Post-construction Storm Water Pollution Prevention: Bioinfiltration swales will be constructed at the bridge approaches in order to treat storm water runoff from the 85th percentile/24 hour storm event. Storm water runoff from the bridge deck will not be treated.

CEQA Compliance: Caltrans, as the lead California Environmental Quality Act (CEQA) agency, determined that this Project qualifies for a Mitigated Negative Declaration on June 21, 2006.

Standard Conditions: Pursuant to Title 23, California Code of Regulations, Section 3860 (23 CCR 3860), the following three standard conditions shall apply to this project:

1) This certification action is subject to modification or revocation upon administrative or judicial review, including review and amendment pursuant to Section 13330 of the California Water Code and 23 CCR 3867.

2) This certification action is not intended and shall not be construed to apply to any discharge from any activity involving a hydroelectric facility requiring a Federal Energy Regulatory Commission (FERC) license or an amendment to a FERC license unless the pertinent certification application was filed pursuant to 23 CCR 3855(b) and the application specifically identified that a FERC license or amendment to a FERC license for a hydroelectric facility was being sought.

3) The validity of any nondenial certification action (actions 1 and 2) shall be conditioned upon total payment of the full fee required under 23 CCR 3833, unless otherwise stated in writing by the certifying agency.

Additional Conditions: Pursuant to 23 CCR 3859(a), the Applicant shall comply with the following additional conditions:

1) The Regional Water Board shall be notified in writing at least five working days (working days are Monday – Friday) prior to the commencement of grading work, with details regarding the construction schedule, in order to allow staff to be present on-site during construction, and to answer any public inquiries that may arise regarding the project.

2) No debris, soil, silt, sand, bark, slash, sawdust, rubbish, cement or concrete washings, oil or petroleum products, or other organic or

earthen material from any construction or associated activity of whatever nature, other than that authorized by this permit, shall be allowed to enter into or be placed where it may be washed by rainfall into Waters of the State or Waters of the United States. When operations are completed, any excess material or debris shall be removed from the work area. No rubbish shall be deposited within 150 feet of the high water mark of any stream.

3) BMPs for sediment and turbidity control shall be implemented and in place prior to, during, and after construction in order to ensure that no silt or sediment enters surface waters.

4) Disturbance or removal of vegetation shall not exceed the minimum necessary to complete operations. The disturbed portions of any Waters of the State or Waters of the United States shall be restored to as near their original condition as possible.

5) A revised revegetation plan shall be received in the Regional Water Board office no later than October 31, 2006. The revegetation plan shall be revised to clarify the criteria for which each impact will be revegetated as was agreed to in the Applicant's June 28, 2006 letter. The revegetation plan shall also be revised to address any alterations to the project subsequent to its preparation on August 11, 2005. The revised revegetation plan shall be subject to Executive Officer approval, and failure to submit the plan as required will be considered a violation of this Order, and the Applicant may be subject to Regional Water Board enforcement actions.

6) A mitigation plan shall be received in the Regional Water Board office no later than October 31, 2006. The mitigation plan shall be subject to Executive Officer approval, and failure to submit the plan as required will be considered a violation of this Order, and the Applicant may be subject to Regional Water Board enforcement actions.

   The plan shall propose in-kind mitigation for temporary and permanent impacts to each type of impacted water and shall be subject to a progressive ratio of mitigation based on temporal losses.

   Should the mitigation plan be approved and mitigation activities completed, resulting in functioning mitigation, **prior** to any impact to Waters of the State or Waters of the United States, the mitigation ratio shall be 1:1. In the event that mitigation activities cannot be satisfactorily completed prior to impacts to Waters of the State or Waters of the United States, the Applicant shall mitigate at a ratio of a minimum of 2:1.

Assuming the impacts occur prior to completion of satisfactory mitigation activities, and the project begins in 2007, the following mitigation ratios shall apply:

In the event that mitigation activities are not completed by the start date of the bridge replacement project, the Applicant shall mitigate at a ratio of 2:1.

In the event that mitigation activities are not completed by December 31, 2007, the Applicant shall mitigate at a ratio of 3:1.

In the event that mitigation activities are not completed by December 31, 2008, the Applicant shall mitigate at a ratio of 5:1.

In the event that mitigation activities are not completed by December 31, 2010, the Applicant shall mitigate at a ratio of 10:1.

The Applicant is required to complete all mitigation activities by December 31, 2011. Failure to present evidence of completion by December 31, 2011, will be considered a violation of this Order, and the Applicant may be subject to Regional Water Board enforcement actions.

7) All fill material used on the site shall be clean and free of contaminants.

8) A copy of this permit shall be provided to the contractor and all subcontractors conducting the work, and shall be in their possession at the work site.

9) All project work will be conducted as described in this Order and in the application submitted by the Applicant, including the installation of post-construction storm water treatment BMPs. If the Regional Water Board is not notified of a significant alteration to the project, it will be considered a violation of this Order, and the Applicant may be subject to Regional Water Board enforcement actions.

10) If, at any time, a discharge to surface waters occurs, or any water quality problem arises, the Project shall cease immediately and the Regional Water Board shall be notified promptly.

11) If the on-site California Coastal Commission biologist reports any water quality concern, the Regional Water Board shall be notified promptly.

12) All special conditions outlined in this Water Quality Certification must be included in the Plans and Specifications prepared by Caltrans for the contractor. All special conditions shall be implemented according to the submitted application and Water Quality Certification.

13) The Applicant shall provide photos of the completed work to the appropriate Regional Water Board staff person, in order to document compliance. The Applicant shall also provide photos of the completed work areas after the first significant rainfall event in order to ensure that erosion control has been successful.

14) This Order is not transferable. In the event of any change in control of ownership of land presently owned or controlled by the Applicant, the Applicant shall notify the successor-in-interest of the existence of this Order by letter and shall forward a copy of the letter to the Regional Water Board at the above address.

To discharge dredged or fill material under this Order, the successor-in-interest must send to the Regional Water Board Executive Officer a written request for transfer of the Order. The request must contain the requesting entity's full legal name, the state of incorporation if a corporation, address, and telephone number of the person(s) responsible for contact with the Regional Water Board. The request must also describe any changes to the Project proposed by the successor-in-interest or confirm that the successor-in-interest intends to implement the Project as described in this Order.

Water Quality Certification:

I hereby issue an order [23 CCR Subsection 3831(e)] certifying that the authorized discharge from the Ten Mile River Bridge Replacement Project (WDID No. 1B02207WNME) will comply with the applicable provisions of sections 301 ("Effluent Limitations"), 302 ("Water Quality Related Effluent Limitations"), 303 ("Water Quality Standards and Implementation Plans"), 306 ("National Standards of Performance"), and 307 ("Toxic and Pretreatment Effluent Standards") of the Clean Water Act [33 USC Subsection 1341 (a)(1)], and with other applicable requirements of State law. This discharge is also regulated under State Water Resources Control Board Order No. 2003-0017-DWQ, "General Waste Discharge Requirements for Dredge and Fill Discharges That Have Received State Water Quality Certification" which requires compliance with all conditions of this Water Quality Certification (enclosed).

Except, as may be modified by any preceding conditions, all certification actions are contingent on: a) the discharge being limited and all work being completed in strict compliance with the Applicant's project description; and b) compliance with all applicable requirements of the

Regional Water Board's Water Quality Control Plan for the North Coast Region (Basin Plan).

Expiration: The authorization of this Order for any dredge and fill activities expires on December 31, 2011. Conditions and monitoring requirements outlined in this Order are not subject to the expiration date outlined above, and remain in full effect and are enforceable.

Please notify Mona Dougherty of our staff at (707) 570-3761 or mdougherty@waterboards.ca.gov prior to construction (pursuant to Additional Condition No. 1 above) so that we can answer any public inquiries regarding the work.

Sincerely,

Signature on File

For Catherine E. Kuhlman
Executive Officer

063006_msd_TenMileRiverBridgeReplacement_401Cert.doc

Enclosure: State Water Resources Control Board Order No. 2003-0017-DWQ, General Waste Discharge Requirements for Dredge and Fill Discharges That Have Received State Water Quality Certification

cc: Mr. Oscar Balaguer, SWRCB, 401 Program Manager

Mr. Tim Vendlinski, Supervisor of Wetlands Regulatory Office (WTR-8), U.S. EPA, Region 9, 75 Hawthorne Street, San Francisco, CA 94105

Ms. Jane Hicks, U.S. Army Corps of Engineers, Regulatory Branch, 333 Market Street, San Francisco, CA 94105

Ms. Corinne Gray, California Department of Fish and Game, Region 3, P.O. Box 47, Yountville, CA 94599

DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, U.S. ARMY CORPS OF ENGINEERS
333 MARKET STREET
SAN FRANCISCO, CALIFORNIA 94105-2197

EXHIBIT NO. **12**
APPLICATION NO.
1-06-022 – CALTRANS
CONDITION COMPLIANCE
ACOE SECTION 404
(1 of 4)

Regulatory Branch (1145b)

JUN 2 6 2006

SUBJECT: File Number 22428N

RECEIVED
SEP 2 9 2006
CALIFORNIA
COASTAL COMMISSION

Mr. Mark R. Moore
Caltrans, District 1
PO Box 3700
Eureka, California 95502-3700

Dear Mr. Moore:

This letter is written in response to your submittal of June 15, 2005 concerning Department of the Army authorization to replace the Tenmile River Bridge and to remove the existing bridge. This project will result in gain of 6.1 yd^2 of wetland and a gain in 9.1 yd^2 of waters of the U.S. including some special aquatic sites. During construction there will be temporary impacts to approximately 1678 yd^2 of wetland habitat. The Project site is located in Mendocino County on State Route 1 where the highway crosses the Tenmile River, approximately 7 miles north of Fort Bragg.

Based on a review of the information you submitted and an inspection of the project site conducted by Corps personnel on June 13, 2006, your project qualifies for authorization under Department of the Army Nationwide Permit (NWP) 3 Maintenance, and 33 Temporary Construction, Access and Dewatering (67 Fed. Reg. 2020, January 15, 2002), pursuant to Section 404 of the Clean Water Act (33 U.S.C. Section 1344) and Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. Section 403). See Enclosure 1. All work shall be completed as described in the "*Biological Assessment, Replacement of Bridge Crossing the Tenmile River, 01-MEN-1-PM69.4/70.1, EA385700, September 2004*", and as discussed and depicted in "*Ten-Mile River Bridge Seismic Retrofit / Replacement, State Route 1, 01-MEN-1-KP 111.7/112.9 (PM 69.2/70.1) EA-01-385700, Initial Study with Proposed Mitigated Negative Declaration*", and as shown in "*Project Plans for Construction on State Highway in Mendocino County Near Fort Bragg from 0.5 KM South to 0.2 KM North of Ten Mile River Bridge, to be Supplemented by Standard Plans dated July, 2004*", and in "*Ten Mile River Bridge (Replace) General Plan*".

The project must be in compliance with the General Conditions cited in Enclosure 2 for this Nationwide Permit authorization to remain valid. Non-compliance with any condition could result in the suspension, modification or revocation of the authorization for your project, thereby requiring you to obtain an Individual Permit from the Corps. This Nationwide Permit authorization does not obviate the need to obtain other State or local approvals required by law.

This authorization will remain valid until March 18, 2007, unless the Nationwide Permit is suspended, modified or revoked. If you have commenced work or are under contract to commence work prior to the suspension, or revocation of the Nationwide Permit and the project would not comply with the resulting Nationwide Permit authorization, you have twelve (12) months from that date to complete the project under the present terms and conditions of the Nationwide Permit. Upon completion of the project and all associated mitigation requirements, you shall sign and return the Certification of Compliance, Enclosure 3, verifying that you have complied with the terms and conditions of the permit.

This authorization will not be effective until you have obtained a Section 401 water quality certification from the North Coast Region Regional Water Quality Control Board (RWQCB). If the RWQCB fails to act on a valid request for certification within two (2) months after receipt of a complete application, the Corps will presume a waiver of water quality certification has been obtained. You shall submit a copy of the certification and the concurrence to the Corps prior to the commencement of work.

To ensure compliance with this Nationwide Permit authorization, the following special conditions shall be implemented:

1. This Corps permit does not authorize you to take an endangered species. In order to legally take a listed species, you must have a separate authorization under the Endangered Species Act (ESA) (e.g., an ESA Section 10 permit or a Biological Opinion (BO) under ESA Section 7 with "incidental take" provisions with which you must comply). The enclosed U.S. Fish and Wildlife Service (FWS) BO received June 23, 2006 and National Marine Fisheries Service (NMFS) BO dated June 9, 2006, contain mandatory terms and conditions to implement the reasonable and prudent measures that are associated with "incidental take" that is also specified in the BOs (Enclosures 4 and 5). Your authorization under this Corps permit is conditional upon your compliance with all of the mandatory terms and conditions associated with incidental take authorized by the attached BOs, whose terms and conditions are incorporated by reference in this permit. Failure to comply with the terms and conditions associated with incidental take of the BOs, where a take of the listed species occurs, would constitute an unauthorized take and it would also constitute non-compliance with this Corps permit. The FWS and NMFS are the appropriate authorities to determine compliance with the terms and conditions of their BOs and with the ESA.

2. FHWA and Caltrans shall adhere to the terms and conditions of the RWQCB Clean Water Act Section 401 Certification that will be issued before commencement of project work.

3. Environmentally sensitive areas shall be clearly delineated on the construction plans and demarcate in the field with high-visibility fencing prior to commencement of construction activities. ESA fencing shall be properly maintained throughout the duration of the project. The ESA shall be off limits to construction activity and personnel at all times.

4. Pile driving work for installing the trestle and falsework for the Tenmile River Bridge Replacement Project can be conducted within the Tenmile River between the high tide lines only between June 15th and October 31st of the first year of construction. During all subsequent years of construction, pile driving work within the Tenmile River between the high tide lines can only be conducted between September 15th and October 31st. For more details on work in the river refer to the National Marine Fisheries Service's Biological Opinion dated June 9, 2006.

5. All project staging and equipment storage areas shall be located away from areas subject to the jurisdiction of the Corps.

6. No debris, oil, petroleum products or other organic material resulting from construction activities shall be allowed to enter or be placed where they may be washed by rainfall, runoff, tidal activity, or gravity into areas subject to the jurisdiction of the Corps.

7. Following project construction, disturbed areas including access points, staging and equipment storage areas, etc. shall be returned to pre-project conditions. This shall include, but is not necessarily limited to, grading to establish pre-project contours, removal of debris and restoration of the natural biological communities to pre-project conditions.

8. In the event of any unanticipated discoveries of potential cultural/historic resources you shall immediately halt work in the vicinity of the discovery and contact the appropriate regulatory authorities. You shall complete consultation pursuant to 36 CFR Part 800 to the satisfaction of the SHPO prior to resuming work.

9. As described in the Eelgrass Mitigation and Monitoring Plan dated June 6, 2005, pre-construction surveys shall be conducted no more 120 days prior to the beginning of construction in the river and again the first growing season post construction. The results will be used to determine the post project mitigation to return the eelgrass population back to pre-project conditions.

10. The contractor may elect to use barges or small boats for portions or all of the river work. If the contractor uses barges and the river is deep enough to accommodate them, they will be low draft platform barges (flexifloats) with spud or jack anchors.

11. Where the old bridge is demolished over land or over wetlands, the bridge will be dropped in sections over filter fabric or similar material so that the natural landscape is protected as much as possible. All parts of the demolished structure will be removed form the site and disposed of in a proper manor.

12. Where the old bridge is demolished over water, a containment system will be in place to prevent sections of the old bridge from falling into the river.

13. Piers of the old bridge will be removed if possible; otherwise the piers will be cut down to a depth of at least 2 feet (0.6 meters) below the existing channel bottom.

14. Wetlands and sensitive areas will be marked with Environmental Sensitive Area fences, Staging areas, storage areas, and equipment parking will not occur within these areas or adjacent to the creek.

15. Restoration of the eelgrass beds in the river will be implemented as described in the Eelgrass Mitigation and Monitoring Plan for the Ten Mile River Bridge Replacement Project dated April 7, 2006, or an agency approved updated version of the same document. An annual report with success criteria and progress toward the goal or re-establishing pre-project eelgrass population densities shall be sent to the San Francisco Corps office each year for 5 years or until success criteria is achieved. Success criteria will be evaluated by the Corps when the first report is received within the first year after construction.

16. Restoration and Revegetation of wetland areas and the rest of the project sites will be implemented as described in the Ten Mile Bridge Revegetation Plan dated July 2005 or in a Corps approved updated version of the same plan. An annual report with success criteria and progress toward the goal or reestablishing pre project conditions shall be sent to the San Francisco Corps office each year for 5 years or until success criteria is achieved. Success criteria will be evaluated by the Corps when the first report is received within the first year after construction.

17. All discharges to surface waters of the river or estuary will be regulated under the site-specific National Pollutant Discharge Elimination System/Waste Discharge Requirement (NPDES/EDR) Permit.

Should you have any questions regarding this matter, please call Hal Durio of our Regulatory Branch at 415-977-8472. Please address all correspondence to the Regulatory Branch and refer to the File Number at the head of this letter. If you would like to provide comments on our permit review process, please complete the Customer Survey Form available through the Forms and Contacts Block on our website: www.spn.usace.army.mil/regulatory/.

Sinc

ORIGINAL

Signature on File

BY

CHIEF, REG. BR., NORTH SECTION

FOR

Jane M. Hicks
Chief, North Section
Regulatory Branch

Enclosures

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