CALIFORNIA COASTAL COMMISSION
NORTH COAST DISTRICT OFFICE
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W14a

ADDENDUM

DATE: October 5, 2012

TO: Commissioners and Interested Parties

FROM: Charles Lester, Executive Director
Alison Dettmer, Deputy Director
Robert S. Merrill, North Coast District Manager
Jim Baskin, Coastal Planner

SUBJECT: **Addendum to Item W14a, California Department of Transportation Coastal Development Permit Amendment No. 1-11-039-A1** for Public Hearing and Action at the October 10, 2012 Meeting in Oceanside

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1. CHANGES TO STAFF REPORT

Since publication of the staff recommendation dated September 21, 2012, Caltrans staff has submitted correspondence requesting several minor changes to the staff recommendation. First, Caltrans asks that the recommendation be modified to include findings supporting the portion of the proposed amendment authorizing the installation of the required bird and bat protective measures in advance of the approval of a final erosion control and water quality protection plan. Second, Caltrans staff has suggested additional changes to the wording of Special Condition 5 which would more clearly distinguish between hydroacoustic monitoring based upon variable-intensity hydraulic impact demolition equipment and single-strike events such as pile driving. Thirdly, Caltrans staff has identified other language in Special Condition 5 of the original permit which had been revised in an addendum presented at the March 2012 project hearing on the original project that staff meant to retain but had inadvertently not included in the permit amendment staff recommendation. Finally, Caltrans staff notes a reference to an erroneous permit number in the description of the revised standard and special conditions that warrants correction. Staff agrees with these minor changes and believes the changes do not affect the consistency of the proposed amendment with the Chapter 3 policies of the Coastal Act and is

incorporating the changes into the staff recommendation. Specific changes to the September 21, 2012 staff report conditions and findings are as follows:

a. On page 2, add a new second sentence to the last paragraph of the Summary of Staff Recommendation to read as follows:

Similarly, staff believes the requested allowance for installing the bird and bat protective measures in advance of the approval of a final erosion control and water quality control plan can be found consistent with the Coastal Act policies for the protection of environmentally sensitive species.

b. On page 4, revise the "Note" regarding the format of revisions to the Standard and Special Conditions to state the correct original CDP number as follows:

Note: The standard conditions and eleven Special Conditions of CDP ~~**1-07-013**~~ **1-11-039** remain in full force and effect except as modified below. CDP Amendment 1-11-039-A1 also includes new Special Condition 12. The modified and new conditions are listed below. The text of all of the original permit conditions is included in Exhibit No. 8.

Changes to the special conditions appear in highlighted text format. Deleted language is shown in ~~**bold double-strikethrough**~~ type; new text appears in **bold double-underlined** font.

c. On page 7, replace the third sentence of Special Condition 5, sub-section C. 1) with the following:

All demolition activities associated with the demolition of the first complete half width of Hinge 8 that may produce sound exposure or sound pressure levels within the water column of the Klamath River shall only be undertaken at Hinge 8 while hydroacoustic monitoring is continuously undertaken.

d. On page 8, replace Special Condition 5, subsection C. 6) with the following:

6) Provide for continuously ~~**counting and recording**~~ **real-time, hydrophone-based monitoring of** demolition "strikes" ~~**in a manner that enables the time of each strike, the number of strikes,**~~ **utilizing solid state recording and integrating sound level metering, and digital analyzer technologies. The monitoring metrics shall include** the length of time of any cessation of demolition within a work day, the peak sound pressure and other measures of sound energy ~~**per strike**~~, or other information necessary to assess conformance with the dual metric criteria set forth above, and to otherwise adequately implement the Plan; and

e. On page 20, revise the first and second paragraphs of the Environmentally Sensitive Habitat Areas findings to read as follows:

Dr. Dixon has determined that, given the results of the bird and bat arrival timing study, an extension of the schedule deadline for the installation of exclusion netting by one month would not unduly expose these sensitive species to risks of injury associated with the repair activities. **Similarly, Dr. Dixon believes that: (1) given the low probability of the arrival of significant number of birds prior to the late February/March timeline when Caltrans has indicated the selection of the contractor will be finalized and preparation of the final erosion and water quality protection plan commences; and (2) the ability of any year-round roosting bats to escape the exclusion netting, allowing installation of the bird and bat protective measures prior to approval of the erosion control and water protection would not result in significant adverse impacts to environmentally sensitive species.**

Furthermore, with respect to the adjustments to the **scheduling constraints on when** vegetation removal ~~**and bird and bat protective measures**~~ **may be undertaken**, Dr. Dixon believes the proposed mitigation measures: (1) to limit work to the initial hand-tool cutting by on-foot work crews; (2) avoid ground disturbance or grading; and (3) utilize the cut materials as ground cover, to be adequate for preventing slope instability or erosion that could impact adjacent riparian and riverine environmental sensitive habitat areas.

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W14a

Filed:	9/11/12
180th Day:	3/10/13
Staff:	J. Baskin-E
Staff Report:	9/21/12
Hearing Date:	10/10/12

STAFF REPORT: MATERIAL AMENDMENT

Amendment Application No.:	**1-11-039-A1**
Applicant:	**California Department of Transportation**
Project Location:	Klamath River Bridge, Highway 101, Del Norte County, south of the town of Klamath, 20 miles south of Crescent City, (between Post Miles 4.04 and 4.42).
Description of CDP 1-11-039:	Repair three hinges supporting the Klamath River Bridge and three 25-ft.-long sections of the bridge affected by construction.
Amendment Request:	Modify Special Conditions 1, 2, 3, 5, 6, 8 and 11 regarding erosion controls, water quality, hydroacoustic monitoring, construction protocols, and bird and bat protection.
Staff Recommendation:	Approval with Special Conditions.

SUMMARY OF STAFF RECOMMENDATION

In this amendment application, the California Department of Transportation (Caltrans) proposes to amend Special Conditions 1, 2, 3, 5, 6, 8 and 11 of Coastal Development Permit (CDP) 1-11-039 granted to Caltrans to repair the Klamath River Bridge at the U.S. 101 crossing of the Klamath River in unincorporated Del Norte County. The proposed changes include:

- Eliminate the 140-fot setback between demolition activities and the river's wet edge;

- Modify hydroacoustic monitoring criteria to use real-time monitoring of cumulative "Sound Exposure Level" associated with the use of rapid, variable strike demolition equipment;
- Allow for concurrent repair of Hinges 8 and 11 within same construction year;
- Extend the completion date for installation of bird and bat protective exclusionary netting from March 1 to April 1;
- Provide for removal of vegetation, subject to work-specific slope stability and erosion control best management practices, prior to the Executive Director's approval of a final erosion control and water quality protection plan; and
- Provide for parking of supervisor vehicles on the bridge during construction.

Since the Coastal Commission approved CDP 1-11-039, the river channel has shifted north resulting in the repair site called "Hinge 8" now located within the wet area of the river year round. As a result, it is no longer feasible to maintain a 140-foot separation between the Hinge 8 repair work and the river's wet edge, which the Commission originally required in order to maintain a sound attenuation buffer to protect fish. Caltrans has submitted an updated underwater noise impact study that concludes that although there will be a shortened distance between the construction site and the river's wet edge, direct and cumulative noise levels will remain below established fish injury thresholds. The original permit also requires that repair of the three hinges be conducted consecutively over a three-year period to distribute the project's effects, particularly noise generation impacts, over a wider time frame. Based on Caltrans' updated underwater noise analysis, the simultaneous demolition of the two hinges would not result in significant cumulative levels of generated noise that would cause an increase in overall noise impacts.

The Commission's staff ecologist has reviewed the updated underwater noise study and concurs with Caltrans' proposed changes with respect to construction locations relative to the wet river and the reduction in the work period from three to two years. The staff believes that with these changes, the project remains consistent with the Coastal Act's ESHA policy. The staff also supports Caltrans' proposed revisions to the hydroacoustic monitoring criteria, provided certain refinements are made to the location of data collection stations. In addition, given new information regarding the typical arrival time for bird and bat species at the project site, the staff agrees that a one month extension to the schedule for the installation and removal of the protective exclusion netting would not expose birds and bats to additional harm.

With respect to the requested changes to remove vegetation necessary to establish access to, and clearance around, the hinge repair sites, and to allow for the parking of construction supervisors' vehicles on the bridge, given Caltrans' commitment to implement interim erosion control and water quality best management practices, staff believes the project, as amended, can still be found consistent with the Coastal Act's oil spill, water quality, and ESHA policies.

The staff therefore recommends approval of proposed modifications to Special Conditions 1, 2, 3, 5, 6, 8, and 11 as shown on Pages 5 - 12 of this report. The staff also recommends **new Special Condition 12** to require that Caltrans' slope stabilization performance standards and source control best management practices associated with the requested changes are incorporated into a phased final erosion control and water quality protection plan.

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APPENDICES

EXHIBITS

I. MOTION AND RESOLUTION

Motion:

I move that the Commission approve the proposed amendment to Coastal Development Permit 1-11-039 pursuant to the staff recommendation.

Staff recommends a **YES** vote. Passage of this motion will result in approval of the amendment as conditioned and adoption of the following resolution and findings. The motion passes only by affirmative vote of a majority of the Commissioners present.

Resolution:

The Commission hereby approves the coastal development permit amendment on the ground that the development as amended and subject to conditions, will be in conformity with the policies of Chapter 3 of the Coastal Act. Approval of the permit amendment complies with the California Environmental Quality Act because feasible mitigation measures and/or alternatives have been incorporated to substantially lessen any significant adverse effects of the amended development on the environment.

II. STANDARD AND SPECIAL CONDITIONS

Note: The standard conditions and eleven Special Conditions of CDP 1-07-013 remain in full force and effect except as modified below. CDP Amendment 1-11-039-A1 also includes new Special Condition 12. The modified and new conditions are listed below. The text of all of the original permit conditions is included in Exhibit No. 8.

Changes to the special conditions appear in highlighted text format. Deleted language is shown in **~~bold double-strikethrough~~** type; new text appears in **bold double-underlined** font.

1. **Construction Standards & Responsibilities.** Construction-related standards and responsibilities shall include, but shall not be limited to, the following requirements and best management practices (BMPs):

(A) The repair activities authorized by CDP 1-11-039 shall be undertaken between June 15 through October 15 annually, except as otherwise specified in the special conditions of CDP 1-11-039, and in accordance with the following requirements:

1. **~~Hinge~~ Hinges** 8 **and 11**, located on the north end of the Klamath River Bridge, shall be repaired during the first construction season commencing June 15, 2013 and ending October 15, 2013 as proposed by Caltrans; **~~Hinges 11 and~~ Hinge** 2 on the **~~north and~~** south **~~ends~~ end** of the Klamath River Bridge, **~~respectively,~~** shall be repaired during the June 15 – October 15 work windows of 2014 **~~(Hinge 11) and 2015 (Hinge 2)~~**;…

(B) Bird and bats exclusion measures shall be installed on the bridge between February 1 and ~~**March**~~ **April** 1 of the forthcoming construction season commencing June 15 of that year, and shall be placed only on the end of the bridge subject to hinge repair during the forthcoming construction season. Exclusion measures shall be removed completely at the end of the pertinent season's construction activities or by October 15, whichever occurs first…

(E) A spill prevention and clean-up kit shall be available on-site for immediate use in case of an accidental spill. Equipment or vehicles operated adjacent to or on the bridge deck above the Klamath River shall be limited to those immediately necessary to complete project work, and shall be checked and maintained daily to prevent leaks. ~~**All other vehicles, including those vehicles for the convenience of site supervisors, shall be parked in the approved staging areas away from the river**~~…

(S) Demolition activities relying on percussive impact techniques (such as battering with a hoe ram) ~~**shall only be undertaken when the nearest waters of the Klamath River channel are at least 140 feet away from the impact point (the pertinent setback distance shall be determined in accordance with the requirements set forth in Special Condition 11) and**~~ shall be limited to daylight hours and weather conditions permitting visual monitoring of the Klamath River for a minimum distance of 300 feet up and down river, as measured from the nearest edge of the bridge deck. A qualified Caltrans biologist shall be on site continuously to monitor riverine habitat during all demolition activities deploying percussive techniques. The monitor shall direct that the Caltrans site supervisor stop work immediately if marine mammals are present, and demolition activities shall not re-commence until marine mammals have moved more than 300 feet from the bridge deck, or as otherwise authorized by a NOAA Fisheries biologist, and with the consent of the Executive Director. The biological monitor shall log all marine mammal sightings and behavioral observations, and provide weekly copies of the daily biological monitoring logs to the Executive Director and to NOAA Fisheries and other agencies requesting copies…

2. Final Erosion Control and Water Quality Protection Plan. (A) ~~**Prior**~~ **Except as otherwise provided for herein, prior to commencement of construction**, Caltrans shall submit for the review and approval of the Executive Director, a final Erosion Control and Water Quality Protection Plan based on**: (a)** the preliminary conceptual erosion control plan prepared by the Caltrans North Region Division of Landscape Architecture in a Caltrans Memorandum dated August 19, 2010 prepared by the North Region Division of Landscape Architecture and in accordance with the "Water Quality Assessment" dated August 10, 2010 prepared by Miguel Villicana, Caltrans NPDES Storm Water Coordinator, North Region Office of Environmental Engineering~~, and~~**; (b)** with the project description components and mitigation measures included in the "Erosion Control, Grading, Drainage and Water Pollution Control Plan dated September 20, 2011 prepared by Todd Lark, Project Engineer~~.~~ (See Exhibit 6 **of original Coastal Development Permit No. 1-11-039**)**; and (c) the project revisions set forth in the revised amended project description, dated September 19, 2012**. The final plan shall be prepared by a licensed civil engineer with substantial training and experience in erosion control and water quality engineering principles and practices. The final plan shall additionally incorporate all of the pertinent requirements of Special Condition 1 set forth above, and shall include the requirement that an as-built plan showing all post-construction Best Management Practices

implemented at the end of the final construction season be submitted to the Executive Director within thirty (30) days after completion or by November 15 of the final construction year. The required final report shall additionally document the stabilization of all disturbed soil areas, the backfilling and recontouring of excavation areas to return the areas to pre-project conditions, and the removal of all temporary BMPs from the project site, as proposed in the approved plan. If the report documents that any of the BMP measures identified in the plan failed to meet the objectives of stabilizing soils and returning disturbed areas to pre-project conditions following completion of construction, the permittee shall submit a revised or supplemental site-specific erosion and sediment control plan to compensate for those portions of the original plan that did not meet the post-construction plan objectives. Water quality (SWPPP or other) inspection reports shall be made timely available to Commission staff upon request…

5 Hydroacoustic Impact Limits and Monitoring for Demolition of Hinge 8. A. Demolition activities at Hinge 8 (location generally shown in Exhibit 3 of the staff report dated January 26, 2012) authorized by CDP 1-11-039 shall not produce sound exposure or sound pressure levels within the waters of the Klamath River in excess of either component of the dual metric exposure criteria listed below. ~~**Each strike**~~ **Sonic energy produced by strikes** of the hoe ram or other impact-based demolition equipment deployed during the subject activities shall be ~~**counted,**~~ measured, and logged by the hydroacoustic monitor~~**, the biological monitor,**~~ and retained in the permanent project records.

~~**DUAL METRIC EXPOSURE CRITERIA:**~~

~~**1) SEL-accumulated: The SEL-accumulated threshold shall be defined as an accumulated Sound Exposure Level (SEL) at or above 183 dB re one micropascal squared-second, measured and calculated in accordance with the simple summation procedure where Total SEL = Single Strike SEL + 10log(number of strikes), based on real-time hydroacoustic monitoring and calculation methods set forth in the monitoring plan required herein.**~~

~~**2) Peak SPL: The Peak SPL shall be defined as the peak sound pressure level (SPL) at or above 206 dB re one micropascal from any single-impact strike of the hoe-ram against the bridge structure, based on real-time hydroacoustic monitoring as set forth in the monitoring plan required herein.**~~

B. By ~~**July 1, 2012**~~ **January 1, 2013**, or within such additional time as the Executive Director may authorize for cause, Caltrans shall submit a **Final** Hydroacoustic Monitoring Plan for Bridge Demolition (hereinafter, "**Final** Plan") to the Executive Director for review and approval. **The Final Plan shall be based upon the protocols and criteria presented in the preliminary "United States Route 101 Klamath River Bridge Hinge Repair Project Hydroacoustic Monitoring Plan," as prepared by ICF International, dated June 26, 2012, as further modified by the additional information requirements and refinements set forth in this Special Condition.** Demolition shall not commence until the Executive Director has approved the ~~**final**~~ **Final** Plan incorporating any changes that the Executive Director may **further** require, and the hydroacoustic monitoring program required by the ~~**final**~~ **Final** Plan is fully implemented. **The Final Plan shall be structured on the following dual-metric noise exposure criteria:**

Sound Exposure Level - Accumulated ($SEL_{cumulative}$): The $SEL_{cumulative}$ threshold shall be defined as an accumulated Sound Exposure Level at or above 183 dB re one micropascal squared-second based on real-time hydroacoustic monitoring methods set forth in the Hydroacoustic Monitoring Plan.

Peak Sound Pressure Level (SPL): Peak Sound Pressure Level shall be defined as the peak sound pressure level at or above 206 dB re one micropascal resulting from the hoe ram striking the bridge structure, based on real-time hydroacoustic monitoring as set forth in the Hydroacoustic Monitoring Plan.

C. At a minimum the **Final** Plan shall include the following:

1) A Caltrans employee authorized to direct the contractor undertaking demolition shall be on site during all demolition activities. Active demolition shall not commence until hydroacoustic monitoring personnel and equipment are deployed in accordance with the requirements of the final approved Plan and the Caltrans biological monitor is on-site and has verified that the hydroacoustic monitoring program is ready to commence. All demolition activities that may produce sound exposure or sound pressure levels within the water column of the Klamath River shall only be undertaken at Hinge 8 while hydroacoustic monitoring is continuously undertaken. The Caltrans biological monitor shall be on site during all hydroacoustic monitoring; and

2) In the event of an exceedance of either criterion of the dual-metric exposure criteria, all pertinent demolition operations shall be immediately stopped and shall not recommence unless the Executive Director, in consultation with the fisheries biologists of the California Department of Fish & Game and the National Marine Fisheries Service so authorizes based on the resumption of hydroacoustic monitoring of all pertinent demolition operations and the deployment of additional sound attenuation or other measures deemed likely by qualified technical experts to return the demolition operations to conformance with the duel-metric exposure criteria;

3) If the return to demolition operations after the implementation of the additional measures discussed in Subparagraph (2) above results in an exceedance of either criterion of the dual metric exposure criteria, demolition operations shall be stopped immediately and shall not re-commence until or unless the Commission approves ~~an~~ **a further** amendment to CDP 1-11-039 that proposes substantial changes to the proposed project that are deemed by the Executive Director to offer a high likelihood of success in preventing further exceedance of the dual metric exposure criteria.

4) Hydroacoustic monitoring shall be implemented during all active demolition activities at Hinge 8, however activities that support demolition but could not transmit sound through the bridge structure or substrate (such as staging, grading, equipment setup) may be undertaken without hydroacoustic monitoring; and

5) The **Final** Plan shall describe a program of hydroacoustic monitoring capable of continuous assessment of the compliance of pertinent Hinge 8 demolition activities with the dual metric exposure criteria set forth above, including the plan for, and maps of, proposed hydrophone and personnel deployment, specified fixed and mobile locations for hydrophone placement (which shall include locations across a proposed transect at specified representative distances on the north, south and mid-river areas, as well as randomized mobile locations) and at a representative and adequate selection of locations ~~**up to 300 feet**~~ up and down-river from the bridge crossing of the river**. A minimum of four fixed monitoring positions shall be established. One fixed position shall be situated beneath the bridge in proximity to Pier 8, and three other fixed stations shall be established at 150-foot distances from the Pier 8 station, one longitudinally and southward along the bridge alignment, and two each laterally up and down river perpendicular to the Pier 8 station, as generally depicted on Figure 2 of the preliminary hydroacoustic monitoring plan. The monitoring shall be conducted pursuant to the protocols and criteria contained in the approved final plan** on a real-time basis, including **documentation of** the number, location, distances, and depths of hydrophones (which shall be located in waters of at least one meter in depth), and associated monitoring equipment and personnel, the method of translating monitoring data into real-time direction, and the method of conveying critical data to the Caltrans site supervisor; and

6) Provide for continuously ~~**counting and recording**~~ **real-time, hydrophone-based monitoring of** demolition "strikes" ~~**in a manner that enables the time of each strike, the number of strikes,**~~ **utilizing solid state recording and integrating sound level metering, and digital analyzer technologies. The monitoring metrics shall include** the length of time of any cessation of demolition within a work day, the peak sound pressure and other measures of sound energy per strike, or other information necessary to assess conformance with the dual metric criteria set forth above, and to otherwise adequately implement the Plan; and

7) Provide for daily logging of the hydroacoustic monitoring results by the Caltrans biological monitor, and daily submittal of summary reports to the Executive Director for the first week of demolition and weekly thereafter, unless non-compliance occurs or the Executive Director requests a different notification schedule. Non-compliance shall be reported immediately to the site supervisor, to the biological monitor and to the Executive Director. Any exceedance of the dual metric criteria shall be logged in the permanent project records, and in the biological monitoring reports; and

8) Provide procedures and contact information for notifying all pertinent parties of any failure to comply with the limits of the dual metric criteria, including the requirement that work stop immediately and not resume until the Executive Director authorizes resumption of work or until ~~**an**~~ **a further** amendment of CDP 1-11-039 is authorized by the Commission, unless the Executive Director determines that no amendment is legally required; and

9) Provide for submittal to the Executive Director of a final written hydroacoustic monitoring report prepared by the consulting acoustician within thirty (30) days after completion of Hinge 8 demolition. The report shall include but is not limited to the providing the hydrological monitoring data, any changes or problems with the field monitoring Plan, compliance with the dual metric criteria set forth above, and description of and assessment of

efficacy of any adaptive measures that were implemented in the demolition activities as the result of the monitoring, or of any field adjustments of the monitoring Plan itself. The final report shall include an assessment of the monitoring plan and recommendations for changes or additions to future monitoring efforts. The final plan shall compare the predicted acoustic impacts of the Hinge 8 demolition with the actual measurements taken during the demolition activities. The report shall include a reconciliation of these comparative modeled and measured sound levels and recommendations for adaptation and/or improvement of future demolition modeling efforts, if applicable…

6. Bird and Bat Exclusion and Protection Plan. (A) All project activities shall be undertaken in accordance with the "Bird and Bat Exclusion and Protection Plan for the Klamath River Bridge Hinge Replacement Project" dated December 2011, submitted by Caltrans on December 15, 2011 attached hereto as Exhibit 5 and as required herein.

(B) All bird and bat exclusion measures selected shall be pre-approved and installed under the supervision of a qualified Caltrans biologist between February 1 and ~~**March**~~ **April** 1 annually, and shall be limited to the location of the single hinge area scheduled for repair during the following construction season. Exclusion measures shall be removed upon completion of that season's construction activities or by October 15, whichever occurs first. All exclusion measures shall be checked daily for the first three days after initial installation, by a qualified Caltrans biologist, to ensure performance of the measure, and to ensure that no entrapment of birds or bats has occurred. If the measures are not performing adequately, or entrapment occurs, removal and release of trapped birds or bats shall be undertaken immediately by a qualified Caltrans biologist, and necessary repairs or adjustments implemented and monitored daily for an additional three days. The exclusion measures shall thereafter be inspected at least weekly, and shall be timely adjusted or repaired and replaced as necessary under the supervision of a qualified Caltrans biologist as needed to protect wildlife. During construction activities taking place near the exclusion areas, exclusion measures shall be adjusted to clear the area where demolition will remove a portion of the bridge and the areas of the bridge on each side of the demolition location will remain subject to exclusion measures until demolition is completed. The exclusion measures shall be checked daily by a Caltrans biologist during the active demolition and at least weekly thereafter until removed.

11. Project Activity Limitations, Schedule, Biological Monitoring Plan. (A) ~~**Demolition activities (such as striking the existing bridge structure with a hoe ram or crane extension) shall only be undertaken when the location of the demolition point of impact on the structure is at least 140 feet from the nearest location of the wetted channel of the river, or in the case of demolition at Hinge 8, when the waters of the wetted channel are no closer to Hinge 8 than Pier 8. Otherwise, the pertinent setback distance shall be determined in the field as follows: From the closest point of the pertinent hinge repair area to the river, find the closest vertical bridge support (pier) toward the wetted channel; then find the point where that pier intersects the ground beneath the bridge; from the point of pier intersection with the ground at the edge of the pier closest to the river, measure horizontally to the nearest edge of the wetted channel. For purposes of this condition, the wetted channel shall be defined as the point where the waters of the river have reached the highest elevation during the previous 24 hours. This distance shall be maintained at a minimum of approximately 140 linear feet (pier to channel, as described herein). The**~~

~~**elevation of the active channel may be lower (further from) this point at any given time due to the continuous fluctuations of tidal influence on the river elevations and the influence of seasonally fluctuating watershed hydrology; however, the controlling measurement remains the location of the wetted channel closest to the demolition site on a 24-hour basis. The pertinent measurements shall be made under the supervision of the Caltrans biological monitor, and recorded in the biological monitoring reports and in the permanent project records of the resident engineer.**~~

~~**(B)**~~ Demolition activities shall be limited to daylight hours and weather conditions permitting visual monitoring of the Klamath River for a minimum distance of 300 feet up and down river, as measured from the nearest edge of the bridge deck. A qualified biologist shall be on site continuously to monitor riverine habitat during all demolition activities deploying impact/battering or other sound-pressure-generating techniques. The monitor shall request, and the Caltrans site supervisor shall ensure that noise-generating activities stop immediately if marine mammals enter the 300-foot area up or downstream from the bridge. Once stopped, project activities shall not re-commence until marine mammals have moved more than 300 feet from the bridge deck, or as otherwise authorized by a NOAA Fisheries biologist, and in consultation with the Executive Director. The biological monitor shall log all marine mammal sightings and behavioral observations, and provide weekly copies of the daily biological monitoring logs to the Executive Director and to NOAA Fisheries and other agencies requesting copies.

~~**(C)**~~**(B)** Activities undertaken within the floodplain of the river shall be limited to June 15 – October 15, annually, except as provided in Section (D) below. Hinge repair shall be undertaken ~~**one hinge location per season, commencing with Hinge 8 repairs on the north side of the bridge in the first construction year (2013), followed by Hinge 11 repairs in the second construction season (2014), and finally by Hinge 2 repairs on the south side of the bridge during the third construction season (2015)**~~ **pursuant to the following schedule:**

Hinges 8 and 11: Concurrently, during the first (2013) construction season.

Hinge 2: During the second (2014) construction season.

Vegetation removal, grading, or other site disturbance shall be limited to the work area associated with the forthcoming season's repairs only ~~**(multiple hinge work areas shall not be cleared or graded in advance)**~~.

~~**(D)**~~**(C)** Excepted activities that may be undertaken within the floodplain outside of the June 15 – October 15 time period shall be limited to:

1. February 1 – March 1 for site preparation such as vegetation removal that does not require grading~~**, and**~~**. The initial cutting of vegetation necessary for clearing and access to the hinge repair site(s) for the forthcoming construction season, to be retained in place for slope stability and erosion control mitigation pursuant to Special Condition 12(b), may be conducted outside of the February 1 to March 1 site preparation time period;**

2. February 1 – April 1 for the placement of bird/bat exclusion measures annually;

~~2.~~ **3.** June 15 – Nov.15 annually for placement of deck sealant, with a 3-day dry weather forecast commencing from the date of sealant application, or as may be extended by the Executive Director for cause; **and**

~~3.~~ **4.** October 16 – June 15 annually, erosion control and revegetation measures that must be undertaken during the rainy season.

~~(E)~~ **(D)** **Prior to commencement of construction,** Caltrans shall submit a plan for biological monitoring by a Caltrans biologist or a qualified biologist retained by Caltrans (not retained by the Contractor), subject to the review and approval of the Executive Director. The monitoring plan shall include the monitoring schedule, logging and reporting provisions, and other measures necessary to ensure that project activities that may affect environmentally sensitive habitat areas and/or water quality are adequately monitored for compliance and for the purpose of identifying adaptive management measures for real-time resolution of compliance concerns that may arise during construction.

12. Interim Slope Stability, Erosion Control and Water Quality Protective Measures. The following hinge repair-related work tasks shall be subject to specific slope stability, erosion control, and water quality protective measures:

a. On-bridge Parking of Construction Supervisorial Vehicles:

(1) Parking shall be restricted to designated parking areas.
(2) Bridge deck drains and/or scuppers around the perimeter of the designated parking areas shall be closed off to prevent the discharge of accidental releases of spilled hazardous materials into coastal waters.
(3) Vehicles and equipment will be inspected daily for leaks;
(4) All leaking vehicles shall be removed immediately from the bridge.
(5) Adequate spill prevention containment, and cleanup supplied shall be maintained onsite at the designated on-bridge parking areas.

b. Initial Vegetation Removal for Accessing and Clearing Construction Sites, Not Requiring Grading or Other Ground Disturbances:

(1) Entry to the hinge work areas shall be by foot; no roads shall be created.
(2) All cutting shall be conducted with hand-held tools (e.g., chainsaw); no wheeled machinery may enter the vegetation removal site.
(3) Work shall only entail the cutting vegetation to the ground; no ground/soil disturbing activities shall occur.
(4) All cut vegetation shall be left onsite and distributed evenly to provide ground cover for preventing any potential soil erosion.
(5) Subsequent removal, or onsite treatment (e.g., piling, slash burning, mulching, lopping and scattering) of the cut vegetation shall be conducted pursuant to approved erosion control, water quality protection, and revegetation plans as required by Special Conditions 2 and 3.

III. FINDINGS AND DECLARATIONS

A. AMENDMENT DESCRIPTION

Project Background and Amendment Overview

On February 9, 2012, the Commission approved with conditions Coastal Development Permit (CDP) 1-11-039 for the Klamath River Bridge Hinges Repair Project as proposed by the California Department of Transportation (Caltrans), entailing the demolition and replacement of three hinge within the concrete span comprising U.S. 101's crossing of the Klamath River, located approximately one mile south of the Klamath township in unincorporated Del Norte County (see **Exhibit Nos. 1-2 and 8**).

As approved, repair of the three bridge hinges, Hinges 2, 8, and 11, was anticipated to be completed over a three year period, with the over-water construction activities limited to specific seasonal periods to minimize construction noise, water quality, and other impacts to aquatic fish and wildlife, including federal- and state-listed endangered and threatened resident and migratory anadromous fish species such as the California Coastal Chinook salmon (*Oncorhynchus tshawytscha*), Central California Coast coho salmon (*Oncorhynchus kisutch*), Central California Coast steelhead (*Oncorhynchus mykiss*), and Coastal cutthroat trout (*Oncorhynchus clarki clarki*), a California Species of Special Concern. In addition, the Commission required a 140-foot spatial buffer requirement between the Hinge 8 repair site and the river's waters necessitating that the work be undertaken during low-flow periods, to assure that attenuation of construction noise was provided to established setback standards.

Other special conditions included provisions for hydroacoustic monitoring of noise associated with repair-related demolition, restrictions on the scheduling of the hinge repairs to avoid potential cumulative noise impacts from concurrent demolition at multiple repair sites, monitoring for the presence of marine mammals, utilization of bird and bat exclusion netting on the underside of the bridge, and requirements that the repair work be performed consistent with approved, time-specified erosion control, water quality protection, revegetation, and archaeological resource mitigation and monitoring plans.

In this amendment request, Caltrans proposes to:

- Revise the performance standards of Special Conditions 1(S) and 11(A) to allow demolition activities to be conducted within 140 feet from river's wetted channel.
- Modify the hydroacoustic monitoring criteria of Special Condition 5 to accommodate real-time monitoring of cumulative Sound Exposure Level associated with the use of rapid, variable strikes associated with "hoe-ram" demolition equipment.
- Modify the project activity schedule of Special Condition 11(C) to allow for concurrent repair of Hinges 8 and 11.
- Revise the project activity schedule of Special Conditions 1(B), 6, and 11(D) to extend the completion date for the installation of bird and bat protective measures from March 1 to April 1.
- Modify the prior-to-commencement-of-construction restriction of Special Condition 2(A) to allow for the removal of vegetation and the installation of bird and bat protective measures

prior to the Executive Director's approval of a final erosion control and water quality protection plan.

- Strike the performance standard in Special Condition 1(E) prohibiting on-bridge parking of work supervisor vehicles.

These six project modifications are described in further detail below.

Locating Hinge Repair Sites within 140 Feet of River Waters

Special Conditions 1(S) and 11(A) establish a 140-foot spatial separation mitigation measure between noise generated by hydraulic impact demolition at the hinge repair sites and fish and other sensitive receptor species (see **Exhibit No. 8, pages 8 and 18**). In addition, these special conditions require that demolition activities relying on percussive impact techniques, such as battering with a hoe ram, be undertaken only when the nearest location of the Klamath River wetted channel is at least approximately 140 feet away from the impact point. The conditions also provide specifications for how the pertinent setback distance between the repair site and river waters is to be determined.

Since issuance of the original permit in March 2012, Caltrans discovered that the river's channel topography had significantly changed since the application for the hinge repair project had been initially submitted in October 2011. During the intervening winter-spring high flows, the river made an avulsive shift to the north, creating a scour hole at Pier 8, the closest bridge member to the Hinge 8 repair site through which the majority of propagated noise energy would be conducted into the river. As a result, Pier 8 is now located within the year-round wetted channel. Thus, it is no longer feasible for the repair work to maintain the 140-foot spatial separation between the Hinge 8 repair site and the wetted river's edge, now situated at an approximately 94 horizontal foot distance (174 noise travel path feet) from the repair site. Accordingly, Caltrans requests relief from this operational restriction.

Modifications to Hydroacoustic Monitoring Criteria

Caltrans also proposes that the specific criteria by which requisite hydroacoustic monitoring is to be conducted be revised. Caltrans has updated its previous underwater noise analysis to reflect the potential decibel levels based on the new, shortened distance between the demolition locations and the river's edge (see **Exhibit No. 5**). As discussed in further detail within Findings Section V.B, below, the anticipated decibel levels during hoe-ram operations originating at the Hinge 8 repair site would be well below the currently accepted fish injury thresholds. Notwithstanding the changes in the river, the hydroacoustic monitoring of cumulative levels of construction noise as required under Special Condition 5 of the original permit, would remain in force for verifying whether or not exceedance of the peak and/or cumulative maximum noise exposure levels occur.

However, the criteria for the hydroacoustic monitoring were developed, in part on protocols and standards developed for discrete noise generation events such as pile-driving. As currently structured, Special Condition 5 requires that the total number of strikes and resulting noise level generated from each strike of the hoe-ram be tallied. Given the rapid, variable intensity, and complex vibratory nature of the strikes associated with hoe-ramming, being more akin to jack-hammering rather than pile driving, compliance with the original monitoring criteria is not

feasible. Accordingly, Caltrans requests that this requirement be removed from the CDP. In its place, Caltrans proposes to conduct real-time monitoring of cumulative noise exposure using an integrated hydrophone-based, digital sound level metering technology capable of analyzing the extremely rapid and chaotic sound energy being produced during hoe ram operations (see **Exhibit No. 6**).

Concurrent Repairs of Hinges 8 and 11

Caltrans also proposes a related change to the construction schedule for the hinge repairs as set forth in Special Condition 11(C). As currently structured, the three bridge hinges would be repaired over a three-year period, limited to one hinge being prepared per year to prevent potential cumulative noise impacts from multiple sources of demolition noise, particularly as might result from conducting the Hinge 8 and 11 repairs simultaneously.

As stated above, Caltrans has reevaluated the noise levels which would be generated at the various hinge repair sites. The revised underwater noise study indicates that, due to the distance between the Hinge 8 and 11 repair sites, and the relative small difference between the noise energy levels that would be generated concurrently at those sites, any resulting combined or harmonic coupling of the sound energy would be at such insignificant volumes as not to cause peak or cumulative noise exceedance at levels harmful to fish. Accordingly, Caltrans now requests that provisions be made to allow for concurrent repairs at Hinges 8 and 11. Such concurrent work would allow for an overall shorter construction schedule, from three to two years, with a corresponding reduction in the period of project effects on coastal resources, including disruption of public access to and along the coast.

Changes to Bird & Bat Protective Measures Installation Schedule

Caltrans is also requesting an adjustment to the required dates for the installation of exclusionary netting beneath and around the periphery of the bridge decking for the purpose of protecting sensitive bird and bat species that may attempt to nest under the bridge during the hinge repair construction seasons. As currently required under Special Conditions 1(B), 6, and 11(D) installation of bird and bat protective measures is limited to the one-month period comprising February 1 to March 1. However, based on supplemental migratory information developed since the March 2012 issuance of the original permit, Caltrans learned that the arrival dates to the project area for the bird and bat species generally occur later into the spring of the year (see **Exhibit No. 7**). Accordingly, Caltrans requests that the installation period be extended to April 1.

Changes to Vegetation Removal Scheduling

The arrival of the selected construction contractor at the project site is anticipated to occur by mid-February to March. Accordingly, scant time would be available for the contractor to prepare, submit, and obtain Executive Director approval of final erosion control and water quality protection plans pursuant to Special Condition 2(A), before the March 1 deadline set forth in Special Condition 11(D) by which vegetation removal to access and clear the repair sites for the upcoming construction season must be completed. Consequently, Caltrans requests that allowance be made for the initial cutting of vegetation before approval of final erosion control and water protection plans, subject to specified slope stability and erosion prevention practices. Once initially felled, the vegetation would be dispersed over the cleared areas where it would

remain in place as interim ground cover over exposed soil areas to stabilize the site from potential erosion. The materials would be removed from the clearings at a later time pursuant to the standards of an approved erosion water quality protection, and revegetation plans.

Provisions for On-bridge Parking of Supervisorial Vehicles

Finally, Caltrans proposes to delete Special Condition 1(E) that prohibits the parking of construction supervisors' vehicles on the bridge decking during the hinge repair construction activities. The purpose of this requirement was to minimize potential accidental releases of hazardous materials, such as fuel, lubricants, and hydraulic fluids from leaking vehicles. Caltrans has expressed concerns regarding the safety of agency and contractor supervisorial personnel associated with the additional transiting by foot between the various repair sites and their off-bridge vehicles that the prohibition would necessitate, and have requested release from the condition. Caltrans proposes to include at the on-bridge parking area specified source control, inlet protection, and cleanup treatment mitigation measures to prevent the entry of spilled materials from on-bridge parked supervisorial vehicles into coastal waters.

B. ENVIRONMENTALLY SENSITIVE HABITAT AREAS

Section 30240 of the Coastal Act states:

> *(a) Environmentally sensitive habitat areas shall be protected against any significant disruption of 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.*

Section 30107.5 of the Coastal Act defines "environmentally sensitive area" (ESHA) as follows:

> *…any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments.*

As discussed above, the project area adjacent to the highway bridge is located within delineated wetlands and riparian habitat adjacent to the Klamath River. These adjacent coastal wetlands and waters provide habitat for a number of marine species, including rare, threatened, or endangered species such coho and Chinook salmon, steelhead trout, and the bridge structure itself provides nesting and roosting habitat for migratory birds and bats, and other species. These adjacent coastal waters and wetland habitats constitute ESHA under the Coastal Act.

The project entails development adjacent to environmentally sensitive habitat areas, namely the riparian corridor and the riverine wetlands of the Klamath River. Vibrations from hydraulic impact hammer hoe-ram demolition equipment would propagate through the bridge structure and into the river waters where, depending upon the intensity of the sound energy generated could result in injuries to environmentally sensitive fish species. The proposed amended development

would also involve entry beneath and along the sides of the bridge on the outer margins of the riparian corridor for initial vegetation removal for access to, and work site clearance of, the various bridge hinge repair sites.

As cited above, Section 30240(b) of the Coastal Act requires that development in areas adjacent to ESHA shall be sited and designed to prevent impacts which would significantly degrade the ESHA and that permitted development shall be compatible with the continuance of the adjacent ESHA.

Under the original permit, Caltrans is responsible for implementing a number of actions to protect sensitive habitats and species, as detailed in the construction performance standards, and approved erosion control, water quality protection, revegetation, bird and bat exclusion plans, as set forth in **Special Conditions 1, 2, 3, 5, 6, 8, and 11.** These plans provide for numerous protective measures and specific best management practices (BMPs) to be implemented alongside the project work, including, but not limited to, the following:

- Construction schedule requirements to limit the time of construction activities to daylight hours, dry-season periods, and for avoiding inclement weather conditions for ensuring avoidance and minimization of impacts associated with the repair work, and to provide for effective monitoring of sensitive receptors.

- Requiring that the project work be conducted pursuant to an approved erosion control and water quality protection BMPs to minimize sediment entrainment, and siltation or other forms of pollution of coastal waters.

- Setting revegetation standards and success criteria for the restoration of areas disturbed during the repair work.

- Instituting protocols for the monitoring of hydroacoustic noise, including contingencies for cessation of work and initiation of reconsultation upon encountered incidents of the exceedance of established maximum peak and accumulated noise exposure levels.

- Timely seasonal installation and removal of exclusionary netting around the bridge's underpinnings for the protection sensitive bird and bat species.

- Minimum setback distances between demolition noise generation sources and the wetted channel of the river to provide a spatial buffer in which construction sound energy could attenuate to less than harmful levels before propagating through riverine habitat.

However, Caltrans is requesting that several of these requisite ESHA-protective practices and standards be adjusted. These requests include: (1) eliminating the 140-foot setback between demolition activities and the river's wetted channel; (2) revising the project activity schedule to allow for concurrent repair of Hinges 8 and 11; (3) modifying the hydroacoustic monitoring criteria to accommodate real-time monitoring of cumulative Sound Exposure Level associated with the use of rapid, variable strikes associated with hoe ram demolition equipment; (4) extending the completion date for the installation of bird and bat protective measures from

March 1 to April 1; and (5) providing for the removal of vegetation and the installation of bird and bat protective measures prior to the Executive Director's approval of a final erosion control and water quality protection plan.

Associated with these requested project changes, Caltrans has presented a revised underwater noise impact study which evaluated the site- and equipment-specific ramifications of the proposed amended permit conditions (see **Exhibit No. 5**). In addition, Caltrans has provided a hydroacoustic monitoring plan designed to address the distinctive sound energy patterns generated by hydraulic impact hammer equipment (see **Exhibit No. 6**). With respect to anticipated levels of ground-borne vibration, and the continued viability of maintaining a 140-foot sound attenuation buffer, the noise impact analysis evidences that:

> … [L]imiting hoe ram operations to a specific horizontal distance would have no effect on the Path D sound transmission path and would not provide any protective measure to fish species.

With regard to the proposed changes to the construction activity schedule to allow for concurrent repairs to Hinges 8 and 11, and the need for dispersing the project work over several years to avoid potential cumulative noise generation at elevated levels, the underwater noise analysis states that:

> [U]nderwater sound levels produced by operations at Hinge 11 are expected to be substantially less than levels produced at Hinge 8. With these values differing by more than 10 dB, the combined sound is not expected to be influenced by the lower sound level produced at Hinge 11…
>
> In summary, this analysis indicates that concurrent operations at Hinge 8 and Hinge 11 would not worsen in-water sound levels relative to one hoe ram operating at Hinge 8.

Finally, with respect to the proposed changes to the hydroacoustic monitoring protocols, the underwater noise analysis observes:

> Equipment or activities that typically emit continuous vibration include excavation equipment, static compaction equipment, tracked vehicles, traffic on a highway, vibratory pile drivers, pile-extraction equipment, and vibratory compaction equipment. Equipment or activities that typically emit single-impact (transient) or low-rate repeated impact vibration include impact pile drivers, blasting, drop balls, pogo stick compactors, and crack-and-seat equipment… **There are no formally adopted criteria for vibratory pile driving or other vibration-generating activities, such as bridge demolition with a hoe ram. In the absence of criteria for these sources, the interim criteria for impact pile driving are often applied. It is, however, generally accepted that this is a highly conservative approach.** [Emphasis added.]

The distinctions between percussive and vibratory noise generation, and its implications on monitoring cumulative sound exposure levels (SEL) in particular, is further evaluated in the hydroacoustic plan submitted by the permittee:

> SEL is a measure of the total sound energy associated with a single event $SEL_{cumutative}$ is a measure of the total or cumulative sound energy associated with multiple events such as multiple pile strikes. Refer to the Caltrans Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish (Caltrans 2009) for detailed definitions of these terms.
>
> The concept of cumulative SEL is used in impact pile driving underwater noise analysis. In a situation where the single strike SEL is relatively consistent and the number of strikes can be counted, the cumulative SEL can be estimated by taking 10 times the logarithm of the number of strikes and adding that value to the single strike SEL. For example, if it takes 1,000 strikes to install a pile and the single strike SEL is 175 dB, the cumulative SEL is calculated as follows.
>
> $$SEL_{cumulative} = 175 + 10_{1og}(1{,}000) = 175 + 30 = 205 \text{ dB}$$
>
> **This method cannot be applied to hoe-ram activity because more than one ram strike will typically occur within one second. In addition, the nature of hoe-ram demolition does not result in consistent single strike SEL values or strikes that can be readily counted. In this situation real time monitoring of the cumulative SEL value is the best approach to ensuring that the cumulative SEL criterion is not exceeded**… [Emphasis added.]

The proposed monitoring plan describes a specific system for real-time monitoring the unique sound energy profile generated by vibratory demolition equipment, such as the hoe-ram. The Commission's senior staff ecologist, John Dixon, Ph.D. has reviewed the request for eliminating the 140-foot noise attenuation buffer and the proposed changes to the hydroacoustic monitoring criteria proposed by Caltrans. Given the findings in the revised underwater noise study, Dr. Dixon concurs that continued imposition of the 140-foot buffer between noise generation sites and the sound-receiving waters of the river would not be needed as a safeguard for limiting noise exposure to sensitive fish within the river.

With regard to noise monitoring, Dr. Dixon believes the proposed empirical based real-time approach to be superior to model assumption-derived analysis for calculating the actual sound exposure levels. Dr. Dixon has also determined that the monitoring revisions proposed by Caltrans are comprehensive and appropriate to protect adjacent ESHA provided certain adjustments are made to the location of the fixed and variable monitoring locations. These recommendations entail: (1) situating fixed monitoring stations F1, F3, & F4 at 150 feet from Position F2, instead of 300 ft; and (2) relocating the zone in which monitoring at variable positions is beyond the perimeter of the fixed monitoring stations. The former recommended revision to the proposed monitoring plan will provide for measurements at safe locations more proximate to the bridge structure where fish transit or hold. The latter monitoring plan adjustment will ensure that the intent of monitoring at variable positions to determine whether

there are anomalously high sound levels at distance, does not include measurements taken from positions closer to the noise generation sources than that would be recorded at the fixed monitoring stations.

Dr. Dixon also evaluated the requests for extending the timeline for installation of bird and bat protective measures from March 1 to April 1, and to allow for the initiation of vegetation removal and installation of the bird and bat netting prior to the approval of a final erosion control and water quality protection plan, with the incorporation of specific slope stability and erosion control BMPs. Accompanying these requests, the permittee provided a detailed bird and bat habitat use study for the bridge locale detailing the typical arrival time of sensitive migratory species (see **Exhibit No. 7**). With respect to typical arrival times for environmentally sensitive cliff swallows, the report states:

> Surveys in 2012 took place on May 15, June 14, 17 and 29, and July 12; during each of these surveys, only a few (i.e., < 10 individuals) cliff swallows were observed flying in the area, and none were observed on the bridge, or behaving interested in the bridge structure. No new nests were seen on the bridge, and no swallows were seen occupying or visiting the older nests or nesting sites on the bridge. By comparison, on June 29, a few cliff swallows were observed nesting on the Dr. Fine Bridge, 30 miles north of the Klamath Bridge, on US-101, over the Smith River. It appears that cliff swallows are not nesting on the Klamath Bridge this year.
>
> Based on local expert birders' reports (eBird and Hunter et al. 2005), on average, the first cliff swallows arrive in the Humboldt/Del Norte coastal region in low numbers during early April. The earliest documented occurrence of cliff swallows in the region was a single swallow on March 23 near the Klamath River Bridge, but it was not nesting (C. Wilson, Caltrans). Cliff swallows continue to increase, and become common in mid-April, and peak in July. The earliest report of nesting in the region was April 9 (in Eureka), but nesting generally appears to begin in mid-May to mid-June.

The report presents the following with respect to the arrival and use of the bridge as habitat by bats:

> Small numbers of bats use the bridge throughout much of the year. Bats (1-6 individuals) have been observed exiting Hinge 8 (our representative hinge, as it is the most accessible and observable) during the months of mid-May through late October. We have not surveyed the bridge outside of these months yet, and it is possible bats are present year round. We will assume they are, unless future surveys show otherwise. We have also recorded bat calls and analyzed them during surveys in May through September. From these we have learned that nine species of bats are present in the vicinity of the bridge during different times of the year (see attached Table 1). Any of these species may use the bridge for roosting, with the exception of Pallid bat, which does not use structures for roosting. Also, as indicated above, there may be large numbers of bats that use the

> interior of the box girders for roosting and possibly as maternal colonies, but perhaps not consistently every year.
>
> Based on these surveys and local expertise, it is probable that bats use the interior of the bridge during the spring-summer, and use the hinges during spring into early autumn, possibly later, or year-round.

Dr. Dixon has determined that, given the results of the bird and bat arrival timing study, an extension of the schedule deadline for the installation of exclusion netting by one month would not unduly expose these sensitive species to risks of injury associated with the repair activities.

Furthermore, with respect to the adjustments to the vegetation removal and bird and bat protective measures, Dr. Dixon believes the proposed mitigation measures: (1) to limit work to the initial hand-tool cutting by on-foot work crews; (2) avoid ground disturbance or grading; and (3) utilize the cut materials as ground cover, to be adequate for preventing slope instability or erosion that could impact adjacent riparian and riverine environmental sensitive habitat areas.

Therefore, for the reasons explained above, the Commission **amends the language of Special Conditions 1(S) and 11(A)** to remove the requirement that the bridge hinge repair sites be located a minimum of 140 feet for the wetted edge of the river channel. In addition, the Commission **amends the language of Special Conditions 1(A) and 11(C) to provide for concurrent repair of Hinges 8 and 11.** Moreover, the Commission finds that the amended hydroacoustic protocols proposed by Caltrans, as revised in accordance with the recommendations of the Commission staff ecologist, are comprehensive and appropriate to protect adjacent environmentally sensitive habitat areas. Accordingly, the Commission **amends the language of Special Condition 5** to require that Caltrans undertake the hydroacoustic monitoring from fixed and variable location stations situated at specific locations where documentation of sound exposure levels in a structured spatial sampling context would result.

With respect to the requested changes in the construction activities schedule to adjust the dates and times by which bird and bat protective measures must be deployed and vegetation removal initiated, contingent upon the incorporation of independent slope stability and erosion control BMPs, the Commission **amends the language of Special Conditions 1(B), 2(A), 6, and 11(D)** to provide additional time for these work tasks.

Finally, the Commission **attaches new Special Condition 12** to require that Caltrans undertake development in conformance with slope stability, erosion control, and water quality protection measures.

Therefore, for all of the reasons set forth above, the Commission finds that as conditioned, the proposed amended project has been designed and sited to prevent impacts which would significantly degrade adjacent ESHA consistent with Section 30240 of the Coastal Act. In addition, the Commission finds that as conditioned to require specified revisions to the hydroacoustic monitoring plan and implementation of the various slope stability, erosion control, and water quality BMPs described in the permit amendment application, together with on-going adherence to the various construction standards and responsibilities for protecting adjacent

ESHA imposed under the original permit, the proposed amended development is consistent with Coastal Act Section 30240.

C. COASTAL WATER QUALITY

Section 30230 of the Coastal Act states as follows:

> *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.*

Coastal Act Section 30231 states:

> *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 waterflow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.*

Section 30232 of the Coastal Act states as follows:

> *Protection against the spillage of crude oil, gas, petroleum products or hazardous substances shall be provided in relation to any development or transportation of such materials. Effective containment and cleanup facilities and procedures shall be provided for accidental spills that do occur.*

Sections 30230 and 30231 of the Coastal Act require in part the maintenance of the biological productivity and quality of marine resources, coastal waters, streams, wetlands, and estuaries necessary to maintain optimum populations of all species of marine organisms and for the protection of human health. Section 30232 of the Coastal Act requires that permitted development provide for the protection against the spillage of crude oil, gas, petroleum products, or other hazardous substances and that effective containment and cleanup facilities and procedures be provided for accidental spills that may occur.

The proposed amendments to the project to allow for initial vegetation removal in advance of an approved erosion control and water quality protection plan, and to eliminate the restriction on the parking of supervisorial vehicles on the bridge during the hinge repair work, have the potential to impact the aquatic biological resources and the quality of coastal waters in ways not previously considered in the review and conditional approval of the original project permit. With respect to conducting vegetation removal in advance of the approval of final erosion control and water

quality protection plans, with no requisite Best Management Practices (BMPs) in place, the clearing of tree canopy and shrub cover would lay bare and expose underlying soils to precipitation and sheet flow runoff, especially during the wet late winter-early spring timeframe, that could result in erosion and destabilization of the upper floodplain banks, and sedimentation of coastal waters. In addition, with the proposed elimination of the prohibition on the parking of supervisorial vehicles, with no specifications in place for addressing spills of fuel, lubricants, hydraulics fluids, and other accidental releases of hazardous materials, the on-bridge vehicle parking would remain as a potentially significant cumulative impact on the quality of coastal waters beneath and downstream of the project site.

In response to these concerns, Caltrans has included with its permit amendment request several proposed slope stability, erosion control, and spill prevention and clean up measures to avoid and reduce the potential impacts to water quality associated with the requested permit condition accommodation for advance vegetation removal and on-bridge parking. These proposed practices would entail (see **Exhibit No. 4, page 3**):

For Vegetation Removal —

- Crews would hike to the hinge work areas-no roads would be created.
- All cutting would be conducted with hand held tools (e.g., chainsaw)-no wheeled machinery would be onsite.
- Work would only involve cutting vegetation to the ground-no ground/soil disturbing activities would occur.
- All cut vegetation would be left onsite and distributed evenly-this would provide ground cover, preventing any potential soil erosion.

For On-bridge Parking —

- Deck drains and/or scuppers will be blocked off.
- Vehicles and equipment will be inspected daily for leaks.
- Spill kits will be available on site.
- Leaking vehicles will be repaired immediately or removed from the bridge.

The Commission's Water Quality Unit staff has reviewed the proposed water quality protection measures and generally concurs that these practices would reduce the potential significant adverse impacts associated with the requested vegetation removal and on-bridge parking. However, it advises against allowances for on-bridge repairs and maintenance of any vehicles found to be leaking fluids. Depending upon the nature of the leak, needed repairs may entail measures well beyond rudimentary adjustment of the leaking component, such as tightening a clamp or connector, or replacing a filling spout cap or cover. For example, the repairs may require the draining out of additional lubricants or other fluids in the process of replacing a failing gasket, seal, or pump. Such repairs would best be conducted at facilities in locations where containment and disposal of such materials could be more appropriately accommodated.

Thus, to ensure ongoing compliance with Coastal Act Sections 30230, 30231, and 30232, the Commission adds **new Special Condition 12**. Special Condition 12 requires Caltrans to implement the proposed water quality mitigation measures with certain revisions relating to disallowing on-bridge repair and maintenance of leaking vehicles.

With the specified revisions to the special conditions imposed to the original permit approval and the addition of a new special condition requiring implementation of the proposed slope stability, erosion control, and water quality BMPs, the biological productivity and the quality of the river appropriate to maintain optimum populations of marine organisms and for the protection of human health will be maintained and restored. Therefore, the Commission finds that the amended project as modified by the revisions to Special Conditions 7 and 10, and new Special Condition 12, is consistent with Sections 30230, 30231, and 30232 of the Coastal Act.

D. PUBLIC ACCESS

Coastal Act Sections 30210, 30211, and 30212 require the provision of maximum public access opportunities, with limited exceptions.

Coastal Act Section 30210 requires in applicable part that maximum public access and recreational opportunities be provided when consistent with public safety, private property rights, and natural resource protection. Section 30211 requires in applicable part that development not interfere with the public's right of access to the sea where acquired through use (i.e., potential prescriptive rights or rights of implied dedication). Section 30212 requires in applicable part that public access from the nearest public roadway to the shoreline and along the coast is provided in new development projects, except in certain instances, such as when adequate access exists nearby or when the provision of public access would be inconsistent with public safety.

In applying Sections 30211 and 30212, the Commission is limited by the need to show that any denial of a permit application based on these sections, or any decision to grant a permit subject to special conditions requiring public access, is necessary to avoid or offset a project's adverse impact on existing or potential public access.

The project as designed will not result in any significant interference with public access. With the exception of the immediate construction sites around the hinge repair site being closed off and the previously authorized night closures of the bridge associated with the staging, routing, and operation of large construction equipment such as overhead cranes, the construction work would not significantly obstruct shoreline or in-water access in the vicinity of the Klamath River Bridge. Moreover, the project work as proposed to be amended to allow for concurrent repair of Hinges 8 and 11 would reduce the construction timeline from three to two years. Such a schedule modification would significantly reduce the duration of construction zone delays and the related inconvenience the hinge repair work would cause to coastal visitors traveling along U.S. Route 101. Therefore, the Commission finds that the proposed project as conditioned is consistent with the public access policies of the Coastal Act.

E. CALIFORNIA ENVIRONMENTAL QUALITY ACT

On May 31, 2011 Caltrans as lead agency certified a Mitigated Negative Declaration (SCH 2010102013) for the subject "*Klamath River Bridge Hinge Replacement Project, United States*

Route 101 in Del Norte County" and identified the project approved by CDP 1-11-039 as the preferred alternative.

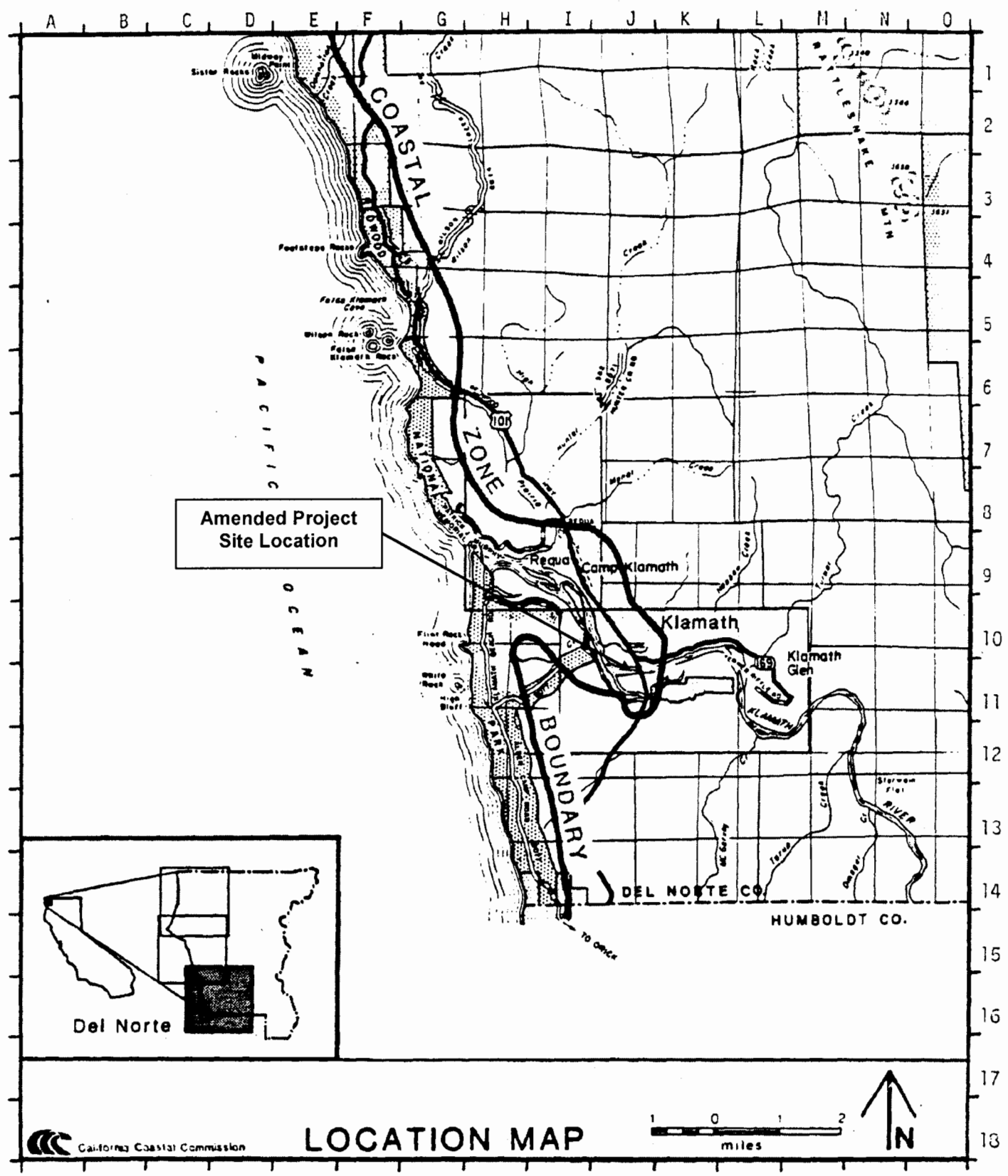
Section 13906 of the Commission's administrative regulation requires Coastal Commission approval of coastal development permit applications to be supported by a finding showing the application, as modified by any conditions of approval, is consistent with any applicable requirements of the California Environmental Quality Act (CEQA). Section 21080.5(d)(2)(A) of CEQA prohibits a proposed development from being approved if there are any feasible alternatives or feasible mitigation measures available, which would substantially lessen any significant adverse effect the proposed development may have on the environment.

The Commission incorporates its findings on Coastal Act consistency at this point as if set forth in full. As discussed above, the project as proposed to be amended has been conditioned to be consistent with the policies of the Coastal Act. No public comments regarding potential significant adverse environmental effects of the project were received prior to preparation of the staff report. 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 required. As conditioned, there are no other feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse impacts which the activity may have on the environment. Therefore, the Commission finds that the proposed amended project, as conditioned to mitigate the identified impacts, can be found consistent with the requirements of the Coastal Act to conform to CEQA.

APPENDIX A:

SUBSTANTIVE FILE DOCUMENTS

1. Coastal Development Permit No. 1-11-039 (Caltrans)



County of Del Norte

EXHIBIT NO. 1

APPLICATION NO.

1-11-039-A1

CALTRANS

REGIONAL LOCATION MAP

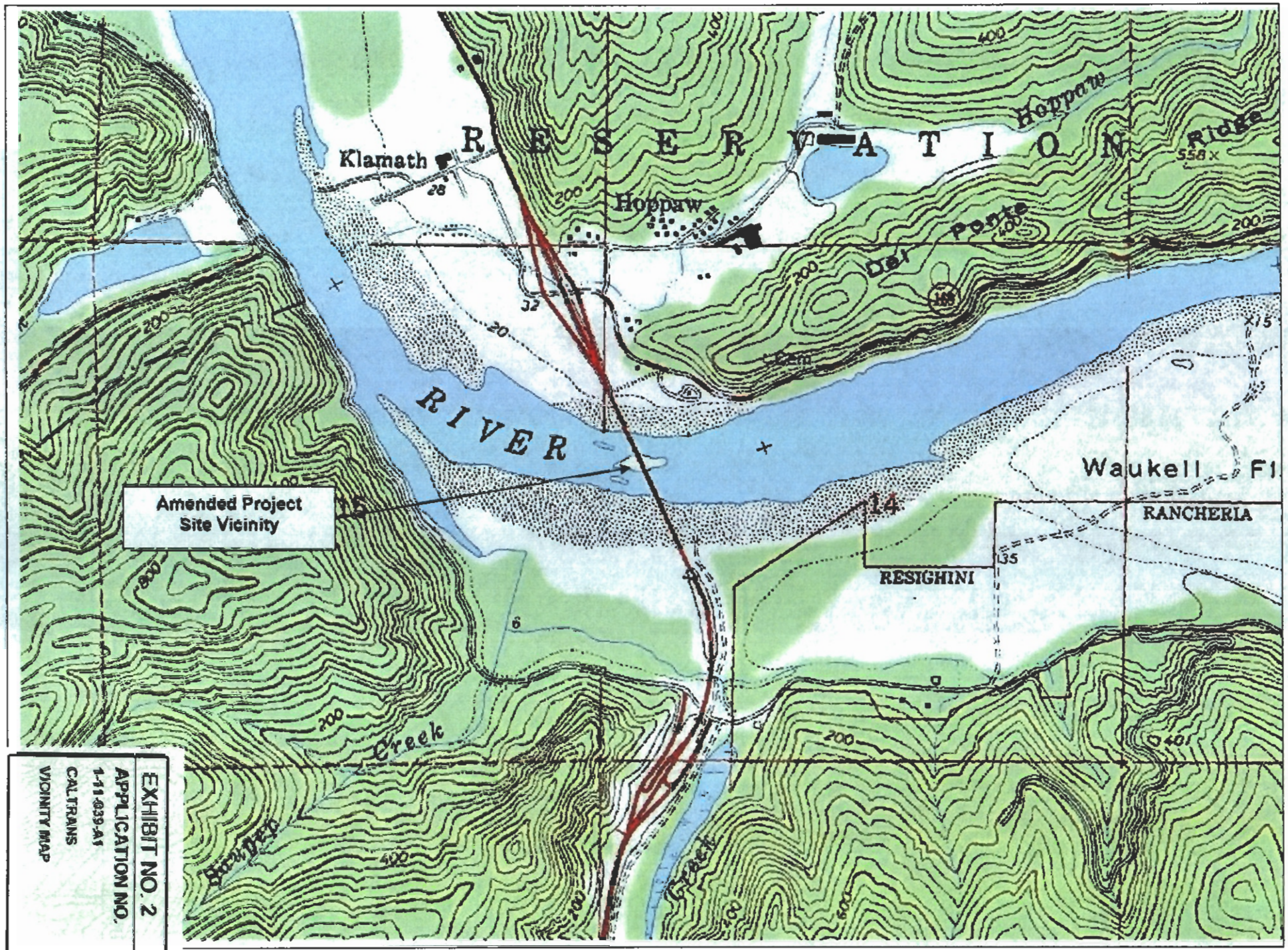


EXHIBIT NO. 2

APPLICATION NO.
1-11-039-A1
CALTRANS
VICINITY MAP

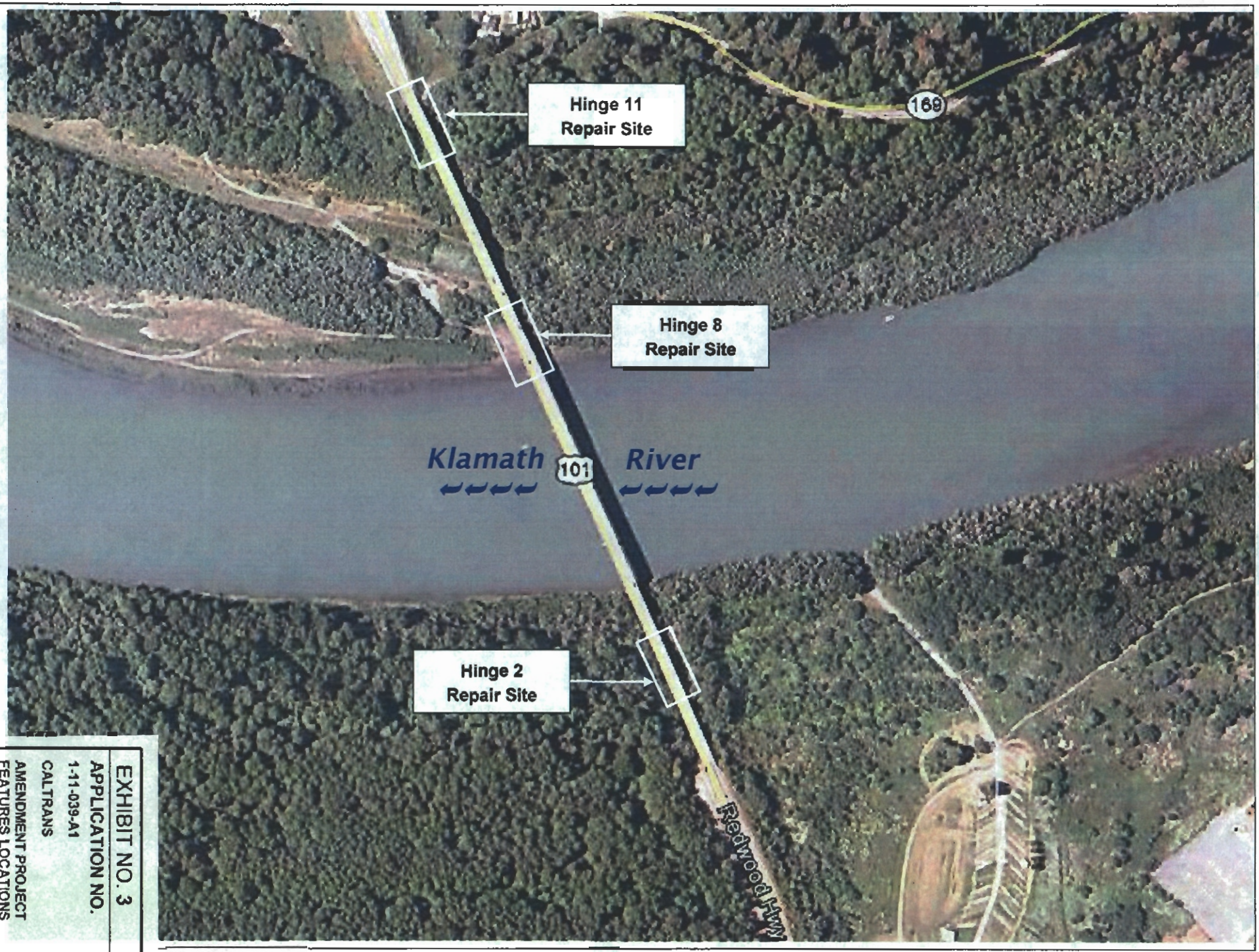


EXHIBIT NO. 3

APPLICATION NO.
1-11-039-A1
CALTRANS
AMENDMENT PROJECT
FEATURES LOCATIONS

DEPARTMENT OF TRANSPORTATION
DISTRICT 1, P.O. BOX 3700
EUREKA, CA 95502-3700
PHONE (707) 441-5615
FAX (707) 441-5775
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EXHIBIT NO. 4
APPLICATION NO.
1-11-039-A1
CALTRANS
AMENDED PROJECT DESCRIPTIONS (1 of 4)

September 19, 2012

File: DN-101-PM 4.04/4.42
Klamath River Bridge
Hinge Replacement
01-47690

Mr. Bob Merrill, District Manager
California Coastal Commission
710 E Street, Suite 200
Eureka, CA 95501

RECEIVED
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COASTAL COMMISSION

Dear Mr. Merrill:

Caltrans received Coastal Development Permit (CDP) #1-11-039 on March 27, 2012 for the Klamath River Bridge Hinge Replacement Project. After reviewing the CDP, it was determined that the permit contained several conditions that would prevent commencement and/or completion of the project. As a result, Caltrans submitted a CDP amendment application on June 14, 2012. After the submittal of the amendment application, Caltrans identified two more conditions that would prevent commencement of the project. Subsequently, Caltrans submitted a letter on July 25, 2012 requesting that two additional amendment items be added to the amendment application.

This letter provides an updated project description that supersedes the project descriptions included in the CDP #1-11-039 amendment application (dated June 14, 2012) and in the subsequent CDP amendment letter (dated July 25, 2012). The following describes the requested CDP amendment items:

CDP Amendment Items

Condition 1B, 6B, and 11D: Installation of Bird and Bat Exclusion Measures
Caltrans will not be able to award the construction contract early enough to allow installation of the bird and bat protective measures before March 1. After a detailed analysis, it was determined that swallows typically do not start nesting on the bridge until May/June, and bats may use the bridge year-round with pupping occurring late April to late August (please note that the bat exclusion measures will allow bats to escape but not re-enter the bridge). Given the swallow and bat use, Caltrans requests that CDP Conditions 1B, 6B, and 11D be modified (amended) to extend the installation window (currently Feb. 1-Mar. 1) of the bird and bat protective measures to April 1. A memo was submitted to your office on July 25, 2012 that explains why delaying the installation will not reduce any protective benefits for swallows and bats.

Condition 1E: Vehicle Parking
Due to safety concerns, vehicle parking on the bridge deck needs to be allowed. The site supervisor vehicle is critical to the safe operation of the work and is the vehicle used to respond to incidents on the job site such as traffic accidents, worker accidents, spill cleanup and emergency response needs. Restricting access in this fashion has no appreciable benefit to coastal resources. In addition, this condition places the traveling public, workers and coastal resources at additional risk for no benefit. Caltrans requests that this condition be removed from the CDP.

Please see Condition 2A (Water Pollution Control Plan) below for the on-bridge water quality measures that will be implemented.

Conditions 1S and 11A: Horizontal Hoe-Ram Distance from River
Since the issuance of CDP #1-11-039, it was discovered that the river channel topography significantly changed, creating a scour hole at Pier 8, resulting in Pier 8 being within river water year-round. As a result, the Underwater Noise Analysis (submitted to your office on June 14, 2012), was updated to reflect the potential decibel levels based on the new, shortened distance between the demolition locations and the river's edge. As shown in Underwater Noise Analysis, the anticipated decibel levels (169 dB peak and 146 dB SEL cumulative) during hoe-ram operations with Pier 8 located directly in the river are well below the currently accepted fish injury thresholds.

According to the hydroacoustic noise engineer (Underwater Noise Analysis, page 8), *"It should be noted that the shortest transmission path from the hoe-ram location at Hinge 8 to the river water is along Path D through Pier 8, which is located directly in the river (Figure 2). Vibration transmitted along Path D is expected to govern underwater sound levels generated by the hoe ram at Hinge 8. Given that Pier 8 is located in the river, the horizontal distance between the hoe ram location at Hinge 8 and the river's edge will not affect underwater sound levels produced by vibration that travels along Path D. Given this, limiting hoe ram operations to a specific horizontal distance would have no effect on the Path D sound transmission path and would not provide any protective measure to fish species."* Given the protective measure of hydroacoustic monitoring will be conducted during the demolition of the first half of Hinge 8, Caltrans requests, based on the engineers above referenced analysis, that the condition of maintaining a distance between the hoe-ram locations and the river's edge be removed from the CDP.

Condition 2A: Water Pollution Control Plan
This condition requires Caltrans to "...submit for the review and approval of the Executive Director, a final Erosion Control and Water Quality Protection Plan based on..." three plans that have already been submitted to the Commission by Caltrans. The contractor prepares the Erosion Control and Water Quality Protection Plan, and, at the earliest, the contract will not be awarded until late February/March. Given this, it will not be possible to have the plan prepared then approved by the Commission before the March 1 deadline for vegetation

removal and bird and bat protective measures installation. Therefore, Caltrans requests that CDP Condition 2A by modified (amended) to state that vegetation removal and the installation of the bird and bat protective measures can proceed prior to the Commission's approval of the final Erosion Control and Water Quality Protection Plan.

As discussed during a Coastal Commission/Caltrans meeting on September 17, 2012, the Commission would like a description of "proposed activity-specific slope stabilization and water quality protection best management practices to be employed for the requested authorizations to allow on-bridge parking of supervisorial vehicles and the commencement of vegetation removal in advance of the approval of comprehensive erosion control and water quality protection plans, as are presently prohibited under Special Condition Nos. 1(E) and 2(A), respectively." The following will be included as part of the project:

On-Bridge Parking

As discussed on the previous page under Condition 1E (Vehicle Parking), due to safety concerns, vehicle parking needs to be permitted on the bridge deck. As discussed at our September 17, 2012 meeting, with the implementation of water quality best management practices, water quality effects would not be anticipated. Water quality measures would include: Deck drains and/or scuppers will be blocked, vehicles and equipment will be inspected daily for leaks, and spill kits will be available on site. Leaking vehicles will be repaired immediately or removed from the bridge.

Vegetation Removal

As discussed at our September 17, 2012 meeting, given the relatively flat topography of the hinge work areas and the nature of the vegetation cutting, effects on water quality would not be anticipated. The vegetation cutting would include:

- Crews would hike to the hinge work areas—no roads would be created
- All cutting would be conducted with hand held tools (e.g., chainsaw)—no wheeled machinery would be onsite
- Work would only involve cutting vegetation to the ground—no ground/soil disturbing activities would occur
- All cut vegetation would be left onsite and distributed evenly—this would provide ground cover, preventing any potential soil erosion

Conditions 5A and 5B: Counting of Strikes during Bridge Hinge Demolition

The CDP requires Caltrans to count each strike of the hoe-ram. Given the vibratory/rapid nature of the strikes associated with hoe-ramming, this condition is not possible to comply with. The hydroacoustic noise engineer provided the following comment after reviewing CDP Condition 5, *"The Coastal Commission permit states that the number of strikes and single strikes SEL values associated with hoe ram operations are to be logged and then used to calculate a cumulative SEL value. This will not be possible because hoe-ram operations involve a series of rapid and highly variable strikes. In addition the ram head is*

often embedded in the concrete making it impossible to visually observe individual strikes. Unlike pile driving which typically imparts consistent levels of energy in a slow and methodical manner, concrete demolition applies variable levels of energy in a somewhat chaotic manner at constantly moving locations in the work area. Counting individual strikes and measuring single strikes SEL values cannot be done in this situation. Real time monitoring of the cumulative SEL value at each monitoring location however will provide the best available approach to ensuring that the cumulative SEL criterion is not exceeded." Based on the hydroacoustic noise engineer's synopsis, Caltrans requests that all language requiring the counting of strikes be removed from the CDP and replaced with language that states that SEL and peak dB data will be based on the real-time hydroacoustic monitoring methods set forth in the Hydroacoustic Monitoring Plan.

Conditions 1A and 11C: Concurrent Demolition at Hinges 8 and 11

Due to Coastal Commission concern over potential elevated in-water decibel levels for concurrent demolition at Hinges 8 and 11, Caltrans agreed to construct the project over three seasons, with one hinge being replaced each summer season. As identified in Table 6 of the Underwater Noise Analysis (submitted to your office on June 14, 2012), the worst case dB peaks for Hinges 8 and 11 are 169 and 157, respectively, and the worst case dB SEL cumulative for Hinges 8 and 11 are 146 and 134, respectively. As described on page 8 of the Underwater Noise Analysis and shown in the report's Table 6, if two sources of noise differ by more than 10 dB the combined sound is not expected to be influenced by the lower sound level. It should be noted that Hinges 8 and 11 are over 500 feet apart. Given this, Caltrans requests the ability to conduct concurrent demolition (hoe-ramming) at Hinges 8 and 11 during the first construction season. Hinge 2 would be constructed during the second construction season.

If you have any questions, please contact Steve Croteau at 707-441-5615.

Thank you,

Kevin Church, Project Manager
Northern Humboldt and Del Norte Counties

cc: Steve Croteau

Memorandum

Date:	June 8, 2012
To:	Steve Croteau California Department of Transportation—North Region Environmental 1656 Union Street Eureka, CA 95501
From:	David Buehler, P.E.
Subject:	**Klamath Bridge Hinge Repair Underwater Noise Analysis**

Introduction

The California Department of Transportation (Caltrans) is planning to repair the United States Route 101 bridge over the Klamath River in northern California. Work will include demolishing part of the bridge deck with hoe rams where three bridge hinges will be replaced. This memorandum evaluates underwater noise levels that potentially will be generated by hoe ram activities.

California Coastal Commission staff has asked for my qualifications for conducting the technical analysis provided in the memo. These qualifications are provided in Appendix A, below.

Vibration and Underwater Noise Fundamentals

Vibration

Operation of heavy construction equipment, particularly pile-driving and other impact devices such as pavement breakers, creates seismic waves that radiate along the surface of the earth and downward into the earth. These surface waves can be felt as ground vibration. Vibration from operation of this equipment can result in effects ranging from annoyance of people to damage of structures. Varying geology and distance will result in different vibration levels containing different frequencies and displacements. In all cases, vibration amplitudes decrease with increasing distance.

Perceptible ground-borne vibration is generally limited to areas within a few hundred feet of construction activities. As seismic waves travel outward from a vibration source, they excite the particles of rock and soil through which they pass and cause them to oscillate. The actual distance that these particles move is usually only a few ten-thousandths to a few thousandths of an inch. The rate or velocity (in inches per second) at which these particles move is the commonly accepted descriptor of the vibration amplitude, referred to as the peak particle velocity (PPV).

Vibration velocity can also be expressed using decibel notation (VdB). Table 1 summarizes typical vibration amplitudes and levels generated by construction equipment (Federal Transit Administration 2006).

Table 1. Vibration Amplitudes and Velocities for Construction Equipment

Equipment	PPV (inches/second) at 25 feet	Vibration Level (VdB) at 25 feet
Pile driver—upper range (impact)	1.518	112
Pile driver—typical (impact)	0.644	104
Pile drive—upper range (vibratory)	0.734	105
Pile drive (sonic/vibratory)	0.170	93
Vibratory roller	0.210	94
Hoe ram	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58

Source: Federal Transit Administration 2006.

Vibration amplitude attenuates over distance and is a complex function of how energy is imparted into the ground and the soil conditions through which the vibration travels. The Federal Transit Administration (FTA) (2006) provides the following equations to estimate the vibration amplitude or level at a given distance for typical soil conditions; PPV_{ref} is a reference value from Table 1:

$$PPV = PPV_{ref} \times (25/distance)^{1.5}$$

$$VdB\ (at\ distance) = VdB\ (at\ 25\ feet) - 30\log(distance/25)$$

Caltrans (2004) identifies a similar equation for vibration attenuation based on various soils types.

$$V = kD^{-n}$$

Where

V = PPV of the seismic wave

k = value of velocity at 1 unit of distance

D = distance from the vibration source

n = slope or attenuation rate

The recommended slope attenuation rates are as follows (California Department of Transportation 2004).

Class I soils (n=1.4): Weak or soft soils—loose soils, dry or partially saturated peat and muck, mud, loose beach sand and dune sand, recently plowed ground, soft spongy forest or jungle floor, organic soils, topsoil. *(Shovel penetrates easily.)*

Class II soils (n=1.3): Competent soils—most sands, sandy clays, silty clays, gravel, silts, weathered rock. *(Can dig with shovel.)*

Class III soils (n=1.1): Hard soils—dense compacted sand, dry consolidated clay, consolidated glacial till, some exposed rock. *(Cannot dig with shovel, need pick to break up.)*

Class IV soils (n=1.0): Hard, competent rock—bedrock, freshly exposed hard rock. *(Difficult to break with hammer.)*

The slope attenuation rates identified above correlate to the following decibel attenuation rates:

Class I soils (n=1.4): 8.4 dB per doubling of distance.

Class II soils (n=1.3): 7.8 dB per doubling of distance.

Class III soils (n=1.1): 6.6 dB per doubling of distance.

Class IV soils (n=1.0): 6 dB per doubling of distance.

These rates are consistent with the two FTA equations above where the exponent of 1.5 correlates to a decibel attenuation rate of 9 dB per doubling of distance.

Tables 2 and 3 summarize the typical human sensitivities to transient and continuous vibration that is usually associated with construction activity. Equipment or activities that typically emit continuous vibration include excavation equipment, static compaction equipment, tracked vehicles, traffic on a highway, vibratory pile drivers, pile-extraction equipment, and vibratory compaction equipment. Equipment or activities that typically emit single-impact (transient) or low-rate repeated impact vibration include impact pile drivers, blasting, drop balls, pogo stick compactors, and crack-and-seat equipment (California Department of Transportation 2004).

Table 2. Typical Human Sensitivity to Transient Vibration

PPV	Human Sensitivity
2.0	Severely perceptible
0.9	Strongly perceptible
0.24	Distinctly perceptible
0.035	Barely perceptible

Source: California Department of Transportation 2004.

Table 3. Typical Human Sensitivity to Continuous Vibration

PPV	Human Sensitivity
3.6 (at 2 Hz) to 0.4 (at 20 Hz)	Very disturbing
0.7 (at 2 Hz) to 0.17 (at 20 Hz)	Disturbing
0.10	Strongly perceptible
0.035	Distinctly perceptible
0.012	Slightly perceptible

Source: California Department of Transportation 2004.

Underwater Noise

Because decibels used for airborne sound measurement use a reference level that is different from the reference level used for water, airborne sound levels and underwater sound levels cannot be directly compared. Table 4 provides a range of typical underwater sound levels.

Table 4. Typical Sound Levels in Underwater Environments

Sound Source	Sound Pressure Level (dB-RMS[1])
High explosive at 100 meters	220
Airgun array at 100 meters	200
Unattenuated pile strike at 200–300 meters	180
Large ship at 100 meters	160
Fish trawler passby (low speed) at 20 meters	140
Background with boat traffic (ranging from quiet estuary to water body with boat traffic)	60–100

[1] RMS defined below.

Pile driving in water produces underwater sound that can affect fish. The Caltrans *Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish* (2009) provides a thorough discussion of this issue, including detailed definitions of terminology and measurement metrics.

The following three metrics are commonly used in evaluating hydroacoustic impacts on fish and are expressed in terms of decibels relative to 1 micro-pascal:

- Peak sound pressure level (L_{peak}),
- Root mean square (RMS) level, and
- Sound exposure level (SEL).

The following is a brief discussion of these metrics. When a pile is struck it essentially rings like a bell as indicated below in Figure 1, which plots sound pressure as a function of time for a single pile strike. A pulse is produced that results in an initial instantaneous maximum or peak sound level. After being struck, the pile continues to ring and the sound generated by the pile dies out after about 20 milliseconds. SEL is a measure of the total sound energy associated with the strike event. The RMS value is the square root of the sum of the squares of the pressure contained within a defined period of the waveform. The RMS level expresses the RMS value in decibels.

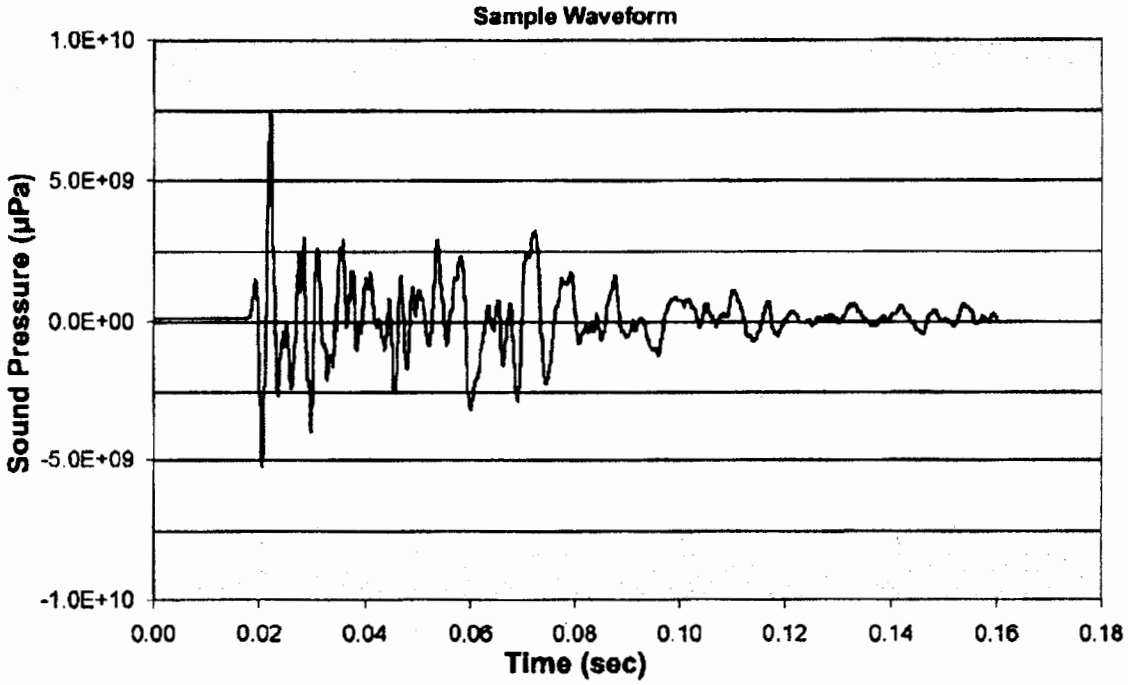

Figure 1. Typical Pile Driving Sound Pressure Waveform

If there are multiple pile strikes within a given period of time, the sound energy from all of those strikes can be added up or accumulated to develop a cumulative SEL value ($SEL_{cumulative}$). With impact pile driving a typical SEL value for single strikes can usually be measured. With the single SEL value and the number of strikes, the cumulated SEL value can be calculated. For example, if it takes 1,000 strikes to install a pile and the single strike SEL is 175 dB, the cumulative SEL is calculated as follows.

$$SEL_{cumulative} = 175 + 10\log(1{,}000) = 175 + 30 = 205 \text{ dB}$$

Underwater Noise Impact Criteria

Over the last 10 years, criteria for evaluating potential effects on fish from sound generated by impact pile driving have evolved as a result of work conducted by the Fisheries Hydroacoustic Working Group (FHWG). This group has representatives from the Federal Highway Administration (FHWA), departments of transportation in Oregon and Washington, National Oceanic and Atmospheric Administration (NOAA) Fisheries Southwest, NOAA Fisheries Northwest, the United States Fish and Wildlife Service, the California Department of Fish and Game, and the Unites States Army Corps of Engineers. Technical fisheries and noise experts also participate in the FHWG.

A meeting of the FHWG in June 2008 resulted in the *Agreement in Principal for Interim Criteria for Injury to Fish from Pile Driving Activities* (Fisheries Hydroacoustic Working Group 2008). The agreed upon criteria identify sound pressure levels of 206 dB peak and 187 dB cumulative SEL as injury thresholds for all listed fishes except those weighing less than 2 grams. For such fishes, the criterion for the cumulative SEL is 183 dB.

NOAA Fisheries also uses 150 dB-RMS as a threshold for behavioral effects. Although this threshold is commonly used to evaluate the potential for adverse behavioral effects, to date NOAA Fisheries has not required implementation of attenuation systems where exceedance of 150 dB-RMS is indicated.

By definition, the peak and $SEL_{cumulative}$ criteria only apply to impact pile driving. There are no formally adopted criteria for vibratory pile driving or other vibration-generating activities, such as bridge demolition with a hoe ram. In the absence of criteria for these sources, the interim criteria for impact pile driving are often applied. It is, however, generally accepted that this is a highly conservative approach. Refer to pages 4-21 and 4-22 of the Caltrans Guidance Manual (California Department of Transportation 2009) for a discussion of this issue.

NOAA Fisheries has developed an Excel spreadsheet for calculating distances within which either the peak or accumulated SEL criteria would be exceeded based on several pile-driving parameters. The spreadsheet is available here: http://www.wsdot.wa.gov/NR/rdonlyres/1C4DD9F8-681F-49DC-ACAF-ABD307DAEAD2/0/BA_NMFSpileDrivCalc.xls

NOAA Fisheries has provided the following guidance within the spreadsheet:

> "... all strikes in any given day are counted, regardless of time between strikes. However, generally the accumulated SEL can be reset to zero overnight (or after a 12 hour period), especially in a river or tidally-influenced waterway when the fish should be moving."

Additional guidance in the spreadsheet relates to the notion of "Effective Quiet" and says:

> "Effective Quiet. When the received SEL from an individual pile strike is below a certain level, then the accumulated energy from multiple strikes would not contribute to injury, regardless of how many pile strikes occur. This SEL is referred to as 'effective quiet', and is assumed, for the purposes of this spreadsheet, to be 150 dB (re: 1 μPa2*sec). Effective quiet establishes a limit on

the maximum distance from the pile where injury to fishes is expected – the distance at which the single strike SEL attenuates to 150 dB. Beyond this distance, no physical injury is expected, regardless of the number of pile strikes."

In summary, when SEL values are less than 150 dB it is assumed that there is no accumulation of sound energy relative to the $SEL_{cumulative}$ criterion.

Impact Assessment

Bridge Deck Demolition—Underwater Noise

Three hinges identified as Hinge 2, Hinge 8, and Hinge 11 on the bridge will be repaired. Figure 2 (attached) shows the locations of the hinges relative to edge of the river. At each hinge location concrete must be removed from the bridge deck with impact equipment. For the purposes of this assessment, it is assumed that a hoe ram or similar device will be used. Caltrans has developed a construction specification that will limit hoe ram energy to 1,200 ft-lbs. Hoe ram energy needs to be limited to avoid damage to nearby areas of the bridge structure that are not being demolished.

It is anticipated that hoe rams will operate at a horizontal distance of no less than 94 feet from the edge of the river, with Hinge 8 being the closest hinge to the river. The location of the edge of the river fluctuates with changes in the tide. Actual vibration transmission paths will be longer because vibration energy will be traveling through the bridge and vertical bridge columns. There are no measured underwater sound level data for operation of a hoe ram on a structure in this configuration.

To develop a reasonable estimate of underwater sound that would potentially result from operation of a hoe ram on a structure, a relationship was determined between the ground vibration level at the water's edge and the measured underwater sound level from pile driving on land. Table 5 (attached) shows the measured underwater sound levels for driving 24-inch-diameter piles at a distance of 230 feet from the water. The ground vibration level produced by pile driving is typically 104 VdB at 25 feet (FTA 2006). Soil borings in the project area indicate that soils fall into the Class II category (n = 1.3), which corresponds to an attenuation rate of 7.8 dB per doubling of distance. This attenuation rate was used to estimate the ground vibration level at the water's edge. A decibel adjustment relationship between the ground vibration level and the measured underwater noise level was then developed. Table 5 (attached) shows the results of this analysis and the adjustment used to estimate underwater sound levels from ground vibration levels at water's edge.

Table 6 (attached) summarizes the evaluation of underwater noise resulting from hoe ram operation at each hinge. Hinge 8 is the critical hinge because it is the closest hinge to the water.

A 1,200 ft-lbs hoe ram typically produces a vibration level of 89 VdB at 25 feet (Federal Transit Administration 2006; California Department of Transportation 2004). Several vibration paths from the hoe ram to the water, including paths through the structure and the ground, were evaluated for each hinge. These paths are identified in Figure 2 (attached) as Paths A through C at Hinge 2, Paths D through F at Hinge 8, and Paths G and H at Hinge 11. An attenuation rate of 6 dB per doubling of

distance was used for the concrete path; this is the rate through solid rock and is considered reasonable for transmission through concrete because concrete is a highly dense material similar to rock. To simplify the calculation, an attenuation rate of 6 dB per doubling of distance was used for transmission through the ground as well. This results in a somewhat more conservative (i.e. higher) result relative to assuming an attenuation rate of 7.8 dB per doubling of distance in the ground. Once the ground vibration level at the water's edge was estimated, the adjustment from Table 5 (attached) was applied to estimate the underwater sound level.

The predicted underwater peak sound levels produced by operation of the hoe ram are more than 35 dB below the peak threshold of 206 dB. Consequently, hoe ram operation is not expected to exceed the 206 dB peak criterion. Per guidance from NOAA Fisheries, SEL values below 150 dB do not accumulate. In this case all predicted SEL values are below 150 dB and exceedance of the accumulated threshold is not indicated either. The results of this analysis are summarized in Table 6 (attached).

It should be noted that the shortest transmission path from the hoe-ram location at Hinge 8 to the river water is along Path D through Pier 8, which is located directly in the river (Figure 2). Vibration transmitted along Path D is expected to govern underwater sound levels generated by the hoe ram at Hinge 8. Given that Pier 8 is located in the river, the horizontal distance between the hoe ram location at Hinge 8 and the river's edge will not affect underwater sound levels produced by vibration that travels along Path D. Given this, limiting hoe ram operations to a specific horizontal distance would have no effect on the Path D sound transmission path and would not provide any protective measure to fish species.

Concurrent Demolition at Hinges 8 and 11

Coastal Commission staff has expressed concern that concurrent demolition operations would result in exceedance of fish injury thresholds that are not otherwise indicated with non-concurrent operations. As a result, an analysis of concurrent hoe ram operations at Hinges 8 and 11 was conducted.

First, it is important to understand a fundamental aspect of sound and vibration decibel levels. If two sources of sound or vibration that produce the same sound or vibration level are placed next to each other, the combined sound or vibration level is 3 dB higher than the sound or vibration level of a single source. For example, if a compressor produces a sound level of 80 dBA at a distance of 50 feet, two compressors producing the same sound level would produce a combined sound level of 83 dB at 50 feet. If one source is 80 dB and the other 75 dB, the combined sound level is 81 dB. The equation for calculating the combined sound level of two sources is:

$$dB_{1+2} = 10\log(10^{(dB_1/10)}+10^{(dB_2/10)})$$

A consequence of this calculation is that when two sources differ in level by more than 10 dB, the combined sound or vibration level is not influenced by the lower sound or vibration level. For example, the combined sound level of sources at 50 dB and 60 dB is 60 dB. The lower source does not influence the overall combined sound level.

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As can be seen in Table 6 (attached), and as would be expected, underwater sound levels produced by operations at Hinge 11 are expected to be substantially less than levels produced at Hinge 8. With these values differing by more than 10 dB, the combined sound is not expected to be influenced by the lower sound level produced at Hinge 11. This also assumes that the equipment would be operating at exactly the same time, which will likely be infrequent given the intermittent nature of demolition work.

In summary, this analysis indicates that concurrent operations at Hinge 8 and Hinge 11 would not worsen in-water sound levels relative to one hoe ram operating at Hinge 8.

Potential Mitigation

This analysis indicates that bridge deck demolition would not result in underwater noise levels that exceed the interim criteria for impact pile driving. Accordingly, no mitigation is indicated.

References

Printed References

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Fisheries Hydroacoustic Working Group. 2008. *Agreement on Principle for Interim Criteria for Injury to Fish from Pile Driving.* Available: <http://www.dot.ca.gov/hq/env/bio/files/fhwgcriteria_agree.pdf>. Accessed: January 24, 2011.

Figure 2. **Klamath River Bridge Hinge Replacement Project: Work Distance from River**

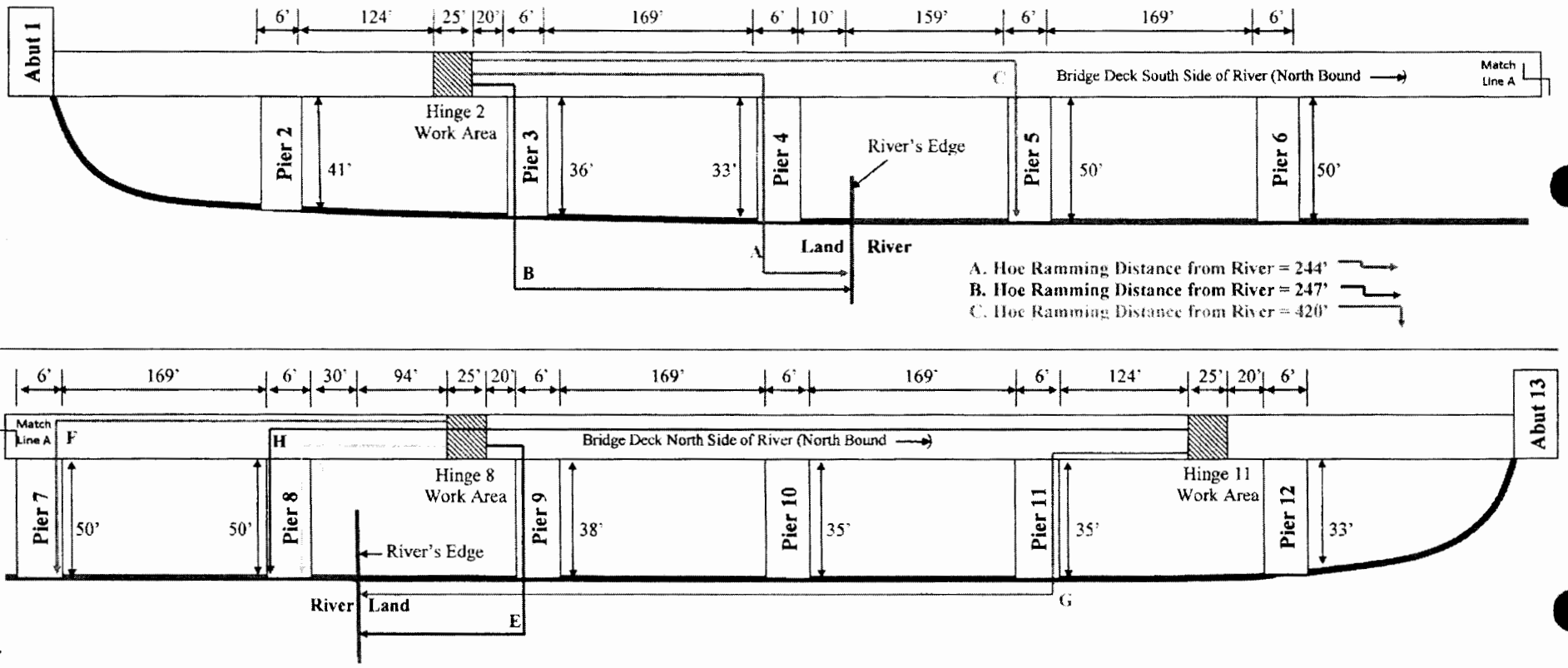

Table 5. Development of Relationship between Ground Vibration at River Edge and Underwater Sound Level

Reference Distance (m)	Reference Distance (ft)	Measured Underwater Sound Level			Estimated Vibration Amplitude at Edge of River (based on Reference Level of 104 dBV at 25 feet)[1]	Adjustment from Vibration at Water Edge to Underwater Sound Level			Reference
		Peak	RMS	SEL		Peak	RMS	SEL	
70	230	175	163	152	79	96	84	73	Caltrans 2009. Table I.2-3. 24-inch diameter steel pile on land. Russian River.

[1] 7.8 dB per doubling of distance for attenuation through soil.

Table 6. Bridge Deck Vibration/Underwater Noise Analysis (June 7, 2012)

Hinge	Hoe Ram Reference Amplitude at 25 feet (dBV)[1]	Path	Concrete Path Distance (feet)	Soil Path Distance (feet)	Total Transmission Path (feet)	Hoe Ram Amplitude at End of Soil/Edge of Water (dBV)[2]	Total Horizontal Distance (feet)	Relationship between Ground Vibration Level at Water Edge from Pile to Resulting Underwater Sound Level (dB)[3]			Estimated Hoe Ram Underwater Sound Level at River (dB)		
								Peak	RMS	SEL	Peak	RMS	SEL
2	89	A	228	16	244	69.6	211	96	84	73	166	154	143
	89	B	56	191	247	69.5	211	96	84	73	166	154	143
	89	C	420	0	420	64.9	211	96	84	73	161	149	138
8	89	D	174	0	174	72.5	94	96	84	73	169	157	146
	89	E	58	139	197	71.5	94	96	84	73	167	155	144
	89	F	349	0	349	66.5	94	96	84	73	163	151	140
11	89	G	159	495	654	61.0	619	96	84	73	157	145	134
	89	H	699	0	699	60.5	619	96	84	73	156	144	133
8 + 11[4]	-	-	-	-	-	-	-	-	-	-	169	157	146

[1] FTA 2006 and Caltrans 2004 for 1,200 ft-lb hoe ram.

[2] Vibration attenuation of 6 dB per doubling of distance through concrete and soil.

[3] See Table 5.

[4] Highest values at Hinges 8 and 11 summed. Because values at Hinge 11 are 10 dB less than at Hinge 8, the summed values equal the Hinge 8 values.

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Appendix A – Qualifications for David Buehler, P.E.

The attached curriculum vitae (CV) provides an overview of my experience and other qualifications to conduct the analysis discussed in this memo. I will summarize my qualifications here. I have a Bachelor's of Science degree in Civil Engineering from California State University, Sacramento and am a licensed Professional Civil Engineer in California and a licensed Professional Acoustical Engineer in Oregon. Oregon is the only state in the United States that offers professional licensing for acoustical engineers. I am also a Board Certified Member of the Institute of Noise Control Engineering (INCE). This is the highest level of certification offered by INCE, which is the foremost professional organization in the United States for noise control engineers.

I have more than 30 years of experience working as a consultant in noise and vibration. Early in my career my experience included working on projects throughout the United States and in Asia and Europe where I measured, evaluated, and predicted ground vibration levels produced by traffic, trains, and heavy construction equipment and determined how that vibration would affect highly sensitive microelectronics production equipment.

For the past 20 years my focus has been on environmental noise and vibration studies for transportation, energy, and other development projects. Since 1998 I have been selected by Caltrans to manage four consecutive on-call contracts to provide noise and vibration services and have managed more than 80 task orders related to project-level and research-level noise and vibration studies, policy development, noise training, and guidance manual development.

Since about 2000 I have also worked extensively on the topic of underwater noise impacts on fish from pile driving. I have been a key participant in long series of meetings and negotiations conducted by the Fisheries Hydroacoustic Working Work (FHWG) to develop injury thresholds for underwater noise. As part of this I worked directly with staff from NOAA Fisheries, including John Stadler and David Woodbury, in the development of the interim thresholds that were ultimately adopted in June of 2008 at the FHWG meeting that I participated in. A copy of the agreement is located here: http://www.wsdot.wa.gov/NR/rdonlyres/4019ED62-B403-489C-AF05-5F4713D663C9/0/BA_InterimCriteriaAgree.pdf.

I am one of two principal authors of the Caltrans guidance document published in 2009 titled "Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish," which is located here: http://www.dot.ca.gov/hq/env/bio/files/Guidance_Manual_2_09.pdf (California Department of Transportation 2009). In this document I describe how to interpret and apply the interim thresholds for pile-driving projects. The analysis methods described are consistent with guidance that has been provided by NOAA Fisheries. Since publication of the guidance manual I estimate that I have conducted 10 to 15 project-level studies to evaluate underwater noise from pile driving.

As a result of my recognized expertise on this topic I was invited by the Transportation Research Board (TRB), a division of the National Research Council—which serves as an independent adviser to the President, the Congress and federal agencies on scientific and technical questions of national importance, to chair a session titled "Hydroacoustics: The Effects and Mitigation of Construction Sound on Fish and Wildlife" at the TRB 2010 national conference. In addition, I gave a presentation

titled "Overview of Pile Driving Impacts on Fish, Current Interim Impact Criteria, and the Caltrans Guidance Manual."

In 2005 I received the Environmental Excellence Award from FHWA for Exemplary Achievement in Ecosystems, Habitat and Wildlife along with several other researchers and engineers who were working on this topic.

In summary, I believe that the discussion above and my CV demonstrate my qualifications to conduct this work.

David M. Buehler, P.E., INCE Bd. Cert.

Education
B.S., Civil Engineering, California State University, Sacramento

Registrations
Professional Acoustical Engineer: Oregon
Professional Civil Engineer: California

Professional Certifications
Board-certified member of the Institute of Noise Control Engineering
Certified by Caltrans to serve as an expert witness on highway noise issues

Professional History
ICF International (formerly Jones & Stokes Associates). Sacramento, CA. Principal. 1990 to present.
Frank Hubach Associates. Richmond, CA. Engineering Partner. 1984 to 1990.
ACI Engineering Consultants, San Francisco, CA. Consultant. 1981 to 1984.

Qualifications Summary

Mr. Buehler is a board-certified member of the Institute of Noise Control Engineering and has over 30 years of experience working as a noise and vibration engineer. Areas of focus include field investigations, impact and mitigation assessment, policy development, training development/implementation, and project management. Mr. Buehler leads and performs analyses of noise and vibration associated with transportation, industrial, energy, commercial, and other projects. He has prepared numerous noise studies in association with California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) documentation for highway, flood control, and energy projects. He has applied the methodology and criteria recommended by federal and state transportation agencies, including the Federal Highway Administration (FHWA), Federal Transit Administration (FTA) and the California Department of Transportation (Caltrans) to evaluate noise impacts and develop mitigation strategies. Mr. Buehler has been retained by Caltrans as an expert witness for several projects involving highway noise issues. He also has extensive experience developing technical guidance manuals and training related to highway traffic and construction noise and vibration. He has served as contract and project manager on four consecutive statewide noise/vibration on-call contracts with Caltrans, under which he has managed over 80 task orders.

Experience

Development and Implementation of Statewide Noise Training Program for the California Department of Transportation (1998 to 2005). Mr. Buehler worked with Caltrans headquarters staff to develop and implement a statewide highway noise training program. Developed nine training modules covering environmental noise fundamentals, the FHWA noise regulation (23CFR772), Caltrans noise policy for implementing the regulation, field investigation methods, computer modeling techniques, noise barrier design, and report preparation. After developing the training plan, Mr. Buehler conducted training for Caltrans headquarters and district staff throughout California. He was also invited by Caltrans to conduct training for noise consultants in the private section who want to work on Caltrans projects. He developed an on-line training version of several of the training modules that are currently available on the Caltrans website.

Development of Technical Guidance Manuals (2003 to 2009). Mr. Buehler has taken a lead role in the development of several guidance manuals for Caltrans. Served as technical editor of the 2009 update of the Caltrans Technical Noise Supplement (TeNS). This manual covers a broad range of technical issues related to

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highway traffic noise including basics of highway noise, noise descriptors, measurements and instrumentation, impact and mitigation analysis, and technical report preparation.

He was the primary author and editor of the Caltrans Transportation- and Construction-Induced Vibration Guidance Manual. This manual provides practical guidance to Caltrans engineers, planners, and consultants who must address vibration issues associated with the construction, operation, and maintenance of Caltrans projects. The manual covers the basic physics of groundborne vibration, construction vibration sources that are of concern to Caltrans, groundborne vibration propagation models, vibration receivers, vibration criteria, and methods for reducing the adverse effects of construction vibration.

Most recently he was a principal author of the Caltrans manual *Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish.* The purpose of this technical guidance manual is to provide Caltrans engineers, biologists, and consultants with guidance related to the environmental permitting of in-water pile driving projects. Specifically, this manual provides guidance on fundamentals of hydroacoustics, fish hearing, and hydroacoustic impacts on fish; environmental documentation and permit applications required for pile driving projects; assessment of potential impacts on fish and their habitat from sound generated from pile driving; measures to avoid or minimize pile driving impacts; and methods to assess impacts, mitigation, and compensation for pile driving impacts on fish.

Mr. Buehler also provided contract oversight in the development of document funded by Caltrans entitled *The Effects of Highway Noise on Birds.* This document developed by Dr. Robert Dooling and Dr. Arthur Popper of the University of Maryland addresses a broad range of issues related to how highway construction and operation noise affects birds.

Highway Noise Policy Development (2004 to present). In 2004 Caltrans initiated an effort to update its noise policy for implementing the FHWA traffic noise regulation (23CFR772) in California. Through a series of workgroup meetings, Mr. Buehler worked directly with Caltrans headquarters and district staff and FHWA staff to identify areas where the policy needed improvement and revision. He then took a lead role in revising and producing the revised policy document, the *Caltrans Traffic Noise Analysis Protocol*, in 2006. In July 2010, the FHWA published its final rule regarding changes to 23CFR772. Each state is required to revise its noise policies to reflect the substantial changes to the federal regulation. Mr. Buehler was retained by Caltrans to work directly with Caltrans and FHWA staff to revise and update the *Caltrans Noise Protocol*, which was published on May 2011.

Development of Quiet Pavement Technologies (2007 to present). Mr. Buehler has managed several projects for Caltrans related to the development of quiet pavement technologies. This includes a project to develop a pavement impedance tube for evaluating the acoustical properties of various pavements types relative to the noise-reducing characteristics of the pavement. Another project involved the measurement of pavement characteristics using on-board sound intensity measurements. The measurements were used to characterize the noise levels produced by a wide variety of pavement types used throughout California. Another project involved the measurement of long-term noise-reducing characteristics at a section of quiet pavement installed along a major interstate route.

Development of Hydroacoustic Impact Criteria for Pile Driving (2004 to present). Mr. Buehler coordinated a multiple agency effort aimed at developing interim impact criteria relating to the effects of underwater pile driving noise on fish. Through this effort, he worked closely with staff from state transportation agencies, resources agencies, and FHWA to review and evaluate relevant data and research. This effort cumulated in multi-agency agreement entitled Agreement in Principal for Interim Criteria for Injury to Fish from Pile Driving. For this effort, Mr. Buehler (and other participants in the effort) was awarded FHWA's Environmental Excellence Award for Exemplary Achievement in Ecosystems, Habitat, and Wildlife. Mr. Buehler was also invited by Mark Ferroni (FHWA's noise team leader) to chair a session at the 2010

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Transportation Research Board Annual meeting in Washington, D.C., on the subject of pile driving impacts on fish.

Highway Traffic Noise Studies (1990 to present.) Mr. Buehler conducted numerous highway traffic noise studies over the last 20 years under the requirements of the FHWA traffic noise regulation (23CFR772). These projects have typically involved conducting field noise studies to characterized existing noise conditions, traffic noise modeling using FHWA-approved noise models, noise abatement analysis, and noise study report preparation. Projects include the I-80 Capacity Improvement Project in Roseville, CA; the SR 49 Widening Project in Nevada County, CA; the SR 4 East Widening Project in Contra Costa County, CA: Harbor Boulevard/U.S. 50 Interchange Project in West Sacramento, CA; I-5 Widening Project in Redding, CA; the I-5 Widening Project in Stockton, CA; the U.S. 50 HOV Lane Project in El Dorado County, CA; and the U.S. 50 Auxiliary Lane Project in Placerville, CA.

On-Call Noise and Vibration Services, Caltrans, California (1998 to present). Mr. Buehler managed four consecutive, multi-year, on-call contract with Caltrans to provide highway noise and vibration consulting services. Under these contracts, Mr. Buehler has managed over 80 task orders covering a wide variety of projects including project level noise studies, special noise and vibration studies, training development and implementation, guidance manual development, best practice development, and policy development.

Expert Witness Services (1999-2009)
Mr. Buehler was retained by Caltrans to serve as an expert witness services in an inverse condemnation lawsuit between Trident Properties and Caltrans. Trident Properties claimed that modification of I-5 near an apartment complex they own was devalued as a result of increased project-related traffic noise. He reviewed project materials and testified at the jury trial on issues related to traffic noise. Mr. Buehler was retained as an expert witness by Caltrans to provide technical expertise relating to a highway widening project in Susanville, California. A commercial property owner along the highway claimed that widening of the highway resulted in increased levels of noise and vibration in his office building. Mr. Buehler conducted noise and vibration testing in the office and prepared a detailed expert report that showed that noise and vibration levels were within accepted standards. Mr. Buehler was retained as an expert by the developer of the SR-125 South Bay Expressway project. The contractor for the SR-125 toll road project made change order claims against the project developer for unforeseen costs associated with noise barriers. Mr. Buehler reviewed project materials and testified before the project arbitration panel.

Publications

Caltrans Transportation- and Construction-Induced Vibration Guidance Manual. June 2004

Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish. February 2009.

Presentations

Transportation Research Board Committee on Transportation-Related Noise and Vibration 2010 Annual Meeting. January 2010. Washington, D.C. Session Co-Chair for Hydroacoustics: The Effects and Mitigation of Construction Sound on Fish and Wildlife. Presentation: "Overview of Pile Driving Impacts on Fish, Current Interim Impact Criteria, and the Caltrans Guidance Manual."

Transportation Research Board Committee on Transportation-Related Noise and Vibration 2009 Annual Summer Meeting. July 2009. Dayton, Ohio. "Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish."

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The California Society for Ecological Restoration 16th Annual Conference. Folsom, California. May 2009. "Noise Considerations for Habitat Restoration Projects."

Transportation Research Board Committee on Transportation-Related Noise and Vibration 2008 Annual Summer Meeting. July 2008. Key West, Florida. "Highway Traffic Noise Lawsuit Against the State of California-A Lesson on the Importance of Good Writing in Noise Study Reports and Environmental Documents"

61st Annual Road Builders' Clinic, Coeur d'Alene, Idaho. March 2007. "Pile Driving in Water – Meeting Environmental Commitments."

Transportation Research Board Committee on Transportation-Related Noise and Vibration 2006 Annual Summer Meeting. July 2006. Williamsburg, VA. "Development of Guidance on the Effects of Pile Driving on Fish. "

Transportation Research Board Committee on Transportation-Related Noise and Vibration 199 Annual Summer Meeting. July 1999. San Diego, CA. "The Relationship between Highway Noise Levels and Level of Service."

Years of Experience: 30

Areas of Expertise

- FHWA Noise Regulation 23CFR772 and Caltrans Traffic Noise Analysis Protocol
- Project level noise studies for highway projects requiring NEPA documentation
- Highway noise training development and implementation
- Highway noise policy development
- Noise and vibration guidance manual development
- Pile driving underwater noise analysis
- Project management and best practices development

Key Projects or Accomplishments

- Managed four consecutive, statewide on-call contracts with Caltrans to provide noise and vibration consulting services
- Development of Caltrans highway noise training program
- Update of the Caltrans Traffic Noise Analysis Protocol
- Development of guidance manuals on transportation noise and vibration
- Development of multi-agency agreement on pile driving noise impact criteria
- *Environmental Excellence Award* from FHWA for Exemplary Achievement in Ecosystems, Habitat and Wildlife, 2005
- Board-certified member, Institute of Noise Control Engineering

UNITED STATES ROUTE 101 KLAMATH RIVER BRIDGE HINGE REPAIR PROJECT

HYDROACOUSTIC MONITORING PLAN

PREPARED FOR:

California Department of Transportation
1656 Union Street
Eureka, CA 95501
Contact: Kevin Church, Project Manager

EXHIBIT NO. 6
APPLICATION NO.
1-11-039-A1
CALTRANS
PROPOSED HYDROACOUSTIC MONITORING PLAN (1 of 10)

PREPARED BY:

ICF International
630 K Street
Sacramento, CA 95814
Contact: David Buehler, P.E.

June 26, 2012

Introduction

The California Department of Transportation (Caltrans) is planning to repair the United States Route 101 bridge over the Klamath River in northern California. Work will include demolishing part of the bridge deck where three hinges will be replaced. Dynamic hoe rams will be used to demolish portions of the bridge deck that will be removed and replaced. Caltrans has developed a construction specification that limits hoe-ram energy to 1,200 ft-lbs. Hoe-ram energy needs to be limited to avoid damage to nearby areas of the bridge structure that are not being demolished. Figure 1 (attached) shows the three hinges that will be repaired. These hinges are identified as Hinge 2, Hinge 8, and Hinge 11.

The hydroacoustic impact assessment prepared for this project (ICF International 2012) indicates that underwater noise levels generated by hoe ram demolition activities will not result in underwater noise levels that exceed fish injury threshold established by NOAA Fisheries. However, the Coastal Commission is requiring that hydroacoustic monitoring be conducted during demolition of the first half width removal of Hinge 8 to ensure that injury thresholds are not exceeded. This hydroacoustic monitoring plan has been prepared to provide details on how underwater noise monitoring will be conducted.

Background on Underwater Sound

Underwater Noise Metrics

Airborne sound is measured using the logarithmic decibel scale. Underwater sound is also measured with a decibel scale. However, because decibels used for airborne sound measurement use a reference level that is different from the reference level used for water, airborne sound levels and underwater sound levels cannot be directly compared. Table 1 provides a range of typical underwater sound levels.

Table 1
Typical Sound Levels in Underwater Environments

Sound Source	Sound Pressure Level (dB RMS)
High explosive at 100 meters	220
Airgun array at 100 meters	200
Unattenuated pile strike at 200–300 meters	180
Large ship at 100 meters	160
Fish trawler passby (low speed) at 20 meters	140
Background with boat traffic (ranging from quiet estuary to water body with boat traffic)	60–100

Pile driving in water or on land near water can produce underwater sound that can affect fish. The Caltrans Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish (2009) provides a thorough discussion of this issue including detailed definitions of terminology and measurement metrics. The following is a brief discussion of common underwater noise metrics.

Peak sound pressure level (L_{peak}), root-mean-squared (RMS) level, sound exposure level (SEL), and the related cumulative sound exposure level ($SEL_{cumulative}$) are commonly used in evaluating hydroacoustic impacts on fish and are expressed in terms of decibels relative to 1 micro-pascal. The peak sound pressure is the instantaneous maximum or minimum overpressure generated by impulse event such as a pile strike. The RMS level is the square root of the sum of the squared pressures multiplied by the time increment and divided by the impulse duration. SEL is a measure of the total sound energy associated with a single event. $SEL_{cumulative}$ is a measure of the total or cumulative sound energy associated with multiple events such as multiple pile strikes. Refer to the Caltrans Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish (Caltrans 2009) for detailed definitions of these terms.

The concept of cumulative SEL is used in impact pile driving underwater noise analysis. In a situation where the single strike SEL is relatively consistent and the number of strikes can be counted, the cumulative SEL can be estimated by taking 10 times the logarithm of the number of strikes and adding that value to the single strike SEL. For example, if it takes 1,000 strikes to install a pile and the single strike SEL is 175 dB, the cumulative SEL is calculated as follows.

$$SEL_{cumulative} = 175 + 10\log(1{,}000) = 175 + 30 = 205 \text{ dB}$$

This method cannot be applied to hoe-ram activity because more than one ram strike will typically occur within one second. In addition, the nature of hoe-ram demolition does not result in consistent single strike SEL values or strikes that can be readily counted. In this situation real time monitoring of the cumulative SEL value is the best approach to ensuring that the cumulative SEL criterion is not exceeded. The approach to measuring cumulative SEL based on real time monitoring is described below.

Underwater Noise Impact Criteria

Over the last 10 years, criteria for evaluating potential effects on fish from sound generated by pile driving have evolved as a result of work conducted by the Fisheries Hydroacoustic Working Group (FHWG). This group includes representatives from the Federal Highway Administration (FHWA), departments of transportation in Oregon and Washington, National Oceanic and Atmospheric Administration Fisheries (NOAA) (Southwest), NOAA Fisheries (Northwest), United States Fish and Wildlife Service, the California Department of Fish and Game, and the Unites States Army Corps of Engineers. Technical fisheries and noise experts also participate in the FHWG.

A meeting of the FHWG in June 2008 resulted in the Agreement in Principal for Interim Criteria for Injury to Fish from Pile Driving Activities (Fisheries Hydroacoustic Working Group 2008). The agreed upon criteria identify sound pressure levels of 206 dB peak and 187 dB cumulative SEL for all listed fishes except those weighing less than 2 grams. For such fishes, the criterion for the cumulative SEL is 183 dB. These criteria were developed specifically for impact pile driving and were not designed to address underwater noise generated by vibratory pile driving, demolition activities, or other sources.

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Monitoring Plan

Equipment

Measurements will be made with hydrophones that have a flat frequency response and are omni-directional over a frequency range of 10 to 10kHz. The selected hydrophone system setup will be designed to withstand the marine and construction environment. The signals will be fed into an appropriate date-logging device, such as an integrating sound level meter (SLM). The systems will have the capability to make quality recordings using a solid state digital audio recorder. The accuracy of the measurement system will be 1 dB from 10 to 10,000 Hz.

The anticipated measurement range for peak sound pressures shall be 160 to 200 dB referenced to 1 micro Pascal (μPa). The measurement system will be able to measure the unweighted or C-weighted sound exposure level in dB referenced to 1 μPa second. The measurement systems will have the capability to provide a real time readout display of measured underwater sound levels. The real-time display will provide the unweighted peak sound pressure and sound exposure level. These data will also be logged during the required measurement event. The maximum peak sound pressure levels along with the sound exposure level for each continuous 1-second period during the event will be captured. Table 2 summarizes the required equipment specifications.

Table 2
Equipment for underwater sound monitoring

Item	Specifications	Quantity	Usage
Hydrophone	Receiving Sensitivity- 211dB ±3dB re 1V/μPa	5	Capture underwater sound pressures and convert to voltages that can be recorded/analyzed by other equipment.
Signal Conditioning Amplifier	Amplifier Gain- 0.1 mV/pC to 10 V/pC Transducer Sensitivity Range- 10^{-12} to 10^{3} C/MU	5	Adjust signals from hydrophone to levels compatible with recording equipment.
Calibrator (pistonphone-type)	Accuracy- IEC 942 (1988) Class 1	1	Calibration check of hydrophone in the field.
SLM and Solid State Recorder	Sampling Rate- 24K Hz or greater	5	Measures and Records data
Laptop computer	Compatible with digital analyzer	1	Store digital data on hard drive
Post-analysis	Real time Analyzer-	1	Monitor real-time signal and post-analysis of sound signals.

Note: All have current National Institute of Standards and Technology (NIST) traceable calibration.

Calibration of measurement systems will be established prior to use in the field each day. An acoustical piston phone and hydrophone coupler will be used along with manufacturer calibration

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certificates to calibrate the measurement system. Calibration of measurement systems will be established as follows:

> Use an acoustically certified piston phone and hydrophone coupler that fits the hydrophone that directly calibrates the measurement system. The volume correction of the hydrophone coupler using the hydrophone is known so that the piston phone produces a known signal that can be compared against the measurement system response. The response of the measurement system is noted in the field book and applied to all measurements.

The SLMs will be calibrated to the calibration tone prior to use in the field. The tone will then be measured by the SLM and recorded on to the beginning of the digital audio recordings that will be used. The system calibration status will be checked by measuring the calibration tone and recording the tones. The recorded calibration tones will be used for subsequent detailed analyses of recorded sound data. The equipment will be calibrated and set to properly measure sounds; i.e. sounds must not overload the instrumentation.

Location

All hydroacoustic monitoring will be conducted at locations where the water is at least one meter deep. This is the minimum distance recommended in the Caltrans manual "Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish" (Caltrans 2009).

Hydrophones will be placed at mid water depth at each location. A weighted tape measure will be used to determine the depth of the water and the measurement depth of each hydrophone. The hydrophones will be attached to a nylon cord or a steel chain if the current is swift enough to cause strumming of the line. The nylon cord or chain will be attached to an anchor that will keep the hydrophone at the specified location. The nylon cord or chain will be attached to a float or tied to a static line at the surface at the specified recording location.

Monitoring will be conducted at four fixed positions and several variable positions up and downstream from the bridge and across the width of the river. All monitoring will be conducted at locations where the water is at least one meter deep. Fixed positions F1, F2, and F3 will be located as close to the northern shore as possible (nearest to Hinge 8) while maintain one meter of water depth (Figure 2 attached). Variable monitoring positions will be located within the highlighted polygon area shown in Figure 2 (attached) with initial positions being closest to the northern shore (nearest to Hinge 8) while maintaining one meter water depth. Variable monitoring positions will be at least 150 feet from any fixed position or previous variable position. The actual fixed positions shown in Figure 2 (attached) may change as necessary to ensure that the measurements are taken in water that is 1 meter deep.

Based on the type of sound-generating activities (e.g., hoe-ram) and anticipated underwater sound levels of 169dB-peak and 146 dB-SEL cumulative (ICF International 2012), one monitoring station would be sufficient to adequately measure the in-water sound levels. The additional monitoring positions indicated in this plan are at the request of the Coastal Commission.

Staffing, Timing, and Communication

The Coastal Commission is requiring hydroacoustic monitoring during hoe-ram activities for the first complete half width removal of Hinge 8. It is anticipated that this will require approximately 6 hours of hoe-ram operation per day for 7 to 10 days.

Hydroacoustic monitoring will be conducted by at least two technical staff from the project acoustical consulting team. A Caltrans employee authorized to direct the demolition contractor and a biological monitor will be on site during all active hoe-ram demolition activities. The hydroacoustic monitoring staff will have direct radio or cell phone communication with the authorized Caltrans employee and biological monitor at all times during active hoe-ram demolition. Active hoe-ram demolition will not start until the biological monitor is on site and has verified that the hydroacoustic monitoring program is ready to commence.

Exposure Criteria

If exceedance of the following criterion occurs, all pertinent demolition operations will be immediately stopped and will not recommence until the Coastal Commission Executive Director, in consultation with the fisheries biologists of the California Department of Fish & Game and the National Marine Fisheries Service, so authorizes:

- Peak sound pressure level at or above 206 dB re: one micro-pascal from any single hoe-ram strike against the bridge
- Cumulative Sound Exposure Level at over above 183 dB re: one micro-pascal

Although not specified in the permit, the cumulative sound exposure level is assumed to be for any given single day of hoe-ram operation at any single position. For the variable position (described below) that could be moved several times a day, the SEL accumulation will be re-set each time the hydrophone is moved to a new position because the purpose of the measurement is to characterize the measured sound level that is unique to each position.

Hydroacoustic Monitoring Method

A weighted tape measure will be used to determine the depth of the water and to locate the hydrophone at mid-depth. An anchor or other means of restraint will be used to maintain the position of the hydrophone. To the extent practicable, a direct line of sight between the Hinge 8 demolition activities and the hydrophones will be maintained.

The acoustic signal from each hydrophone will be continuously recorded during each measurement session to allow for subsequent lab analysis. The peak sound level and cumulative sound exposure level displayed on the sound level meter connected to each hydrophone will be monitored in real time during each measurement session as well.

All field notes would be recorded in water-resistant field notebooks. Such notebook entries will include operator's name, date, time, calibration notes, measurement positions, measured sound levels, hoe-ram information, duration of hoe-ram operations (including start and stop times), system gain setting, and equipment used to make each measurement.

Prior to commencement of hoe-ram demolition at Hinge 8 each day, ambient sound levels will be measured at the fixed positions and the first variable position for at least 1 minute. Measured ambient sound levels will be reported as an overall RMS value averaged over the measurement period. The RMS value, as opposed to peak or SEL value, is used because the goal of the measurement is to characterize the average sound level over the measurements period. Peak and SEL values are used to characterize discrete events such as pile strikes and are not appropriate for characterizing the ambient sound level. A frequency analysis of the averaged acoustic signal will be

conducted and a frequency spectrum of the signal will be reported along with the overall RMS value. If possible, a one minute ambient measurement will be conducted each time the variable position is moved. This may not be possible because hoe-ram operations will continue while the variable position is changed and set up at the next location.

Measurements at the fixed positions will be conducted continuously during active hoe-ram operations for the first complete half width removal of Hinge 8.

Measurements at the variable positions will be a minimum of 60 minutes in duration unless measured levels approach either of the exposure criteria. A measured level is considered to approach a criterion level if it is within 3 dB of the criterion. If either criterion level is approached, monitoring will continue at the variable location until operations for that day are completed or until either criterion is exceeded. If after 60 minutes the criterion levels are not approached or exceeded, the variable measurement location will be moved to the next closest location alternating between upstream and downstream locations. This process of moving the upstream and downstream positions will continue throughout the Hinge 8 hoe-ram demolition operations.

For impact pile driving the cumulative SEL value can be determined in two ways. With the first method the number of strikes and the measured single strike SEL value are used to calculate a cumulative SEL value. With the second method, the cumulative SEL is directly measured in real time using the sound meter connected to the hydrophone. In the case of hoe-ramming, the calculation method is not possible because hoe-ram operations involve a series of rapid and highly variable strikes. In addition, the ram head is often embedded in the concrete making it impossible to visually observe individual strikes. Unlike pile driving which typically imparts consistent levels of energy in a slow and methodical manner, concrete demolition applies variable levels of energy in a somewhat chaotic manner at constantly moving locations in the work area. Counting individual strikes and measuring single strikes SEL values cannot be done in this situation. Real time monitoring of the cumulative SEL value as described above (Equipment section, page 4) will be conducted at each monitoring location. This will provide the best available approach to ensuring that the cumulative SEL criterion is not exceeded.

If, at any time, exceedance of the criterion occurs, all pertinent demolition operations will be immediately stopped and will not recommence until the Coastal Commission Executive Director, in consultation with the fisheries biologists of the California Department of Fish & Game and the National Marine Fisheries Service, so authorizes.

As background, NOAA Fisheries has determined that single strike SEL values less than 150 dB do not accumulate to cause potential injury to fish. In determining if the cumulative SEL criterion is exceeded, consideration will be given to the measured "one second" SEL value during hoe-ram activity. If "one-second" SEL values remain below 150 dB for the entire measurement period then exceedance of the cumulative SEL criterion will not be considered to occur even if the measured cumulative SEL values exceeds the applicable cumulative SEL criterion (183 dB or 187 dB). If "one-second" SEL values exceed 150 dB during part of the measurement, the cumulative SEL value used for comparison to the criterion will be adjusted to exclude sound energy associated with SEL values that are less than 150 dB.

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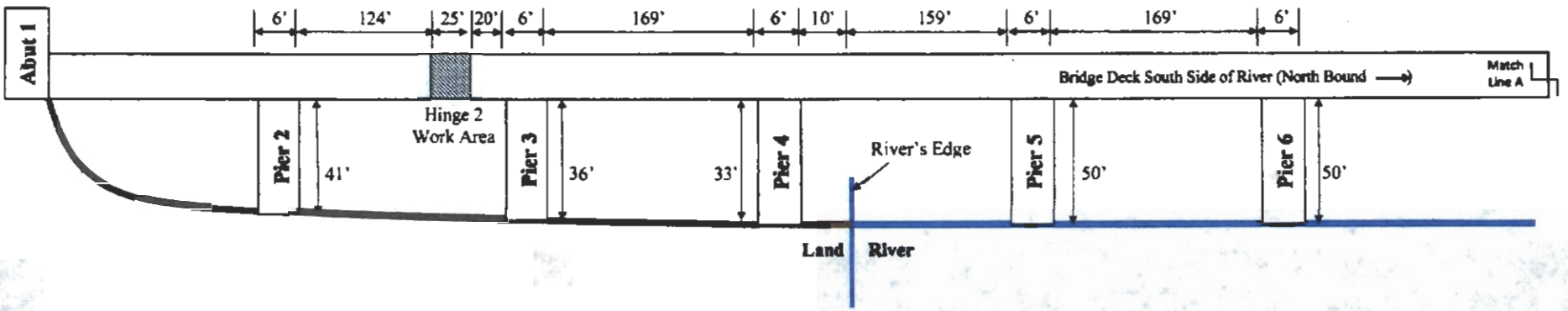
Hydroacoustic Monitoring Report

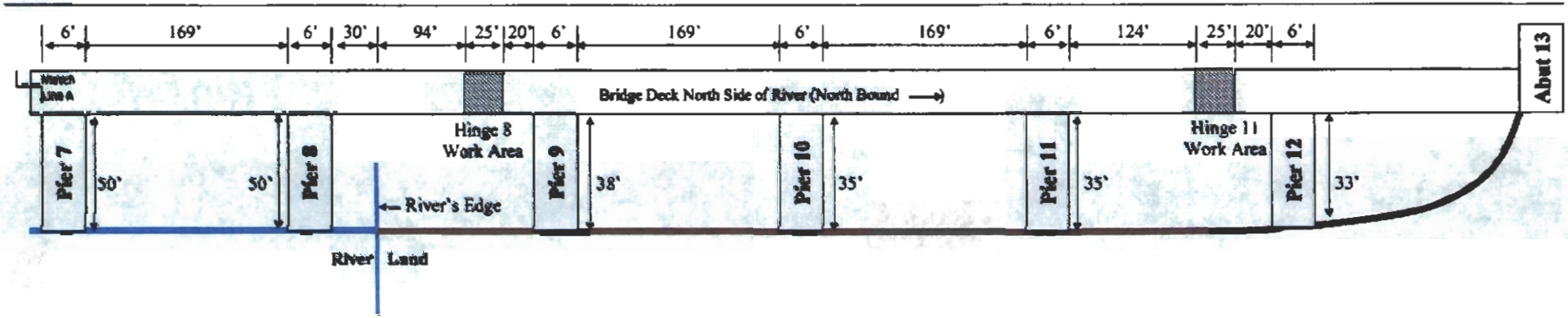
A final written hydroacoustic monitoring report will be prepared by the consulting acoustician within thirty days after completion of Hinge 8 demolition. The report will include but is not limited to the hydroaoustic monitoring data, any changes or problems with the field monitoring plan, compliance with the exposure criteria, and description of and assessment of the efficacy of any adaptive measures that were implemented in the demolition activities as the result of the monitoring, or of any field adjustments of the monitoring plan itself. The final report will include an assessment of the monitoring plan and recommendations for changes or additions to future monitoring efforts. The final report will compare the predicted acoustic impacts of the Hinge 8 demolition with the actual measurements taken during the demolition activities. The report will include a reconciliation of modeled and measured sound levels and provide recommendations for adaptation and/or improvement of future demolition modeling efforts, if applicable.

References

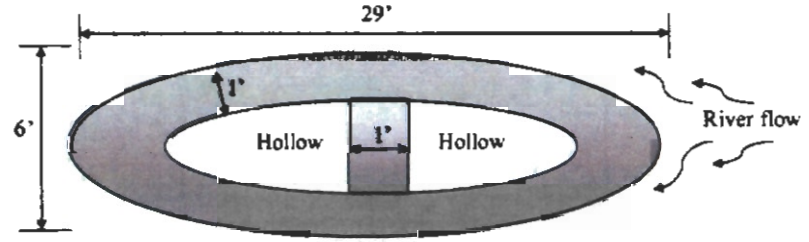
Caltrans. 2009. Technical guidance for assessment and mitigation of the hydroacoustic effects of pile driving on fish. Sacramento, CA.

ICF International. 2012. Klamath bridge hinge repair underwater noise analysis. Memo prepared by David Buehler, P.E.





Not to Scale



Pier Cross-Section

9810

Figure 1. Klamath River Bridge Hinge Replacement Project

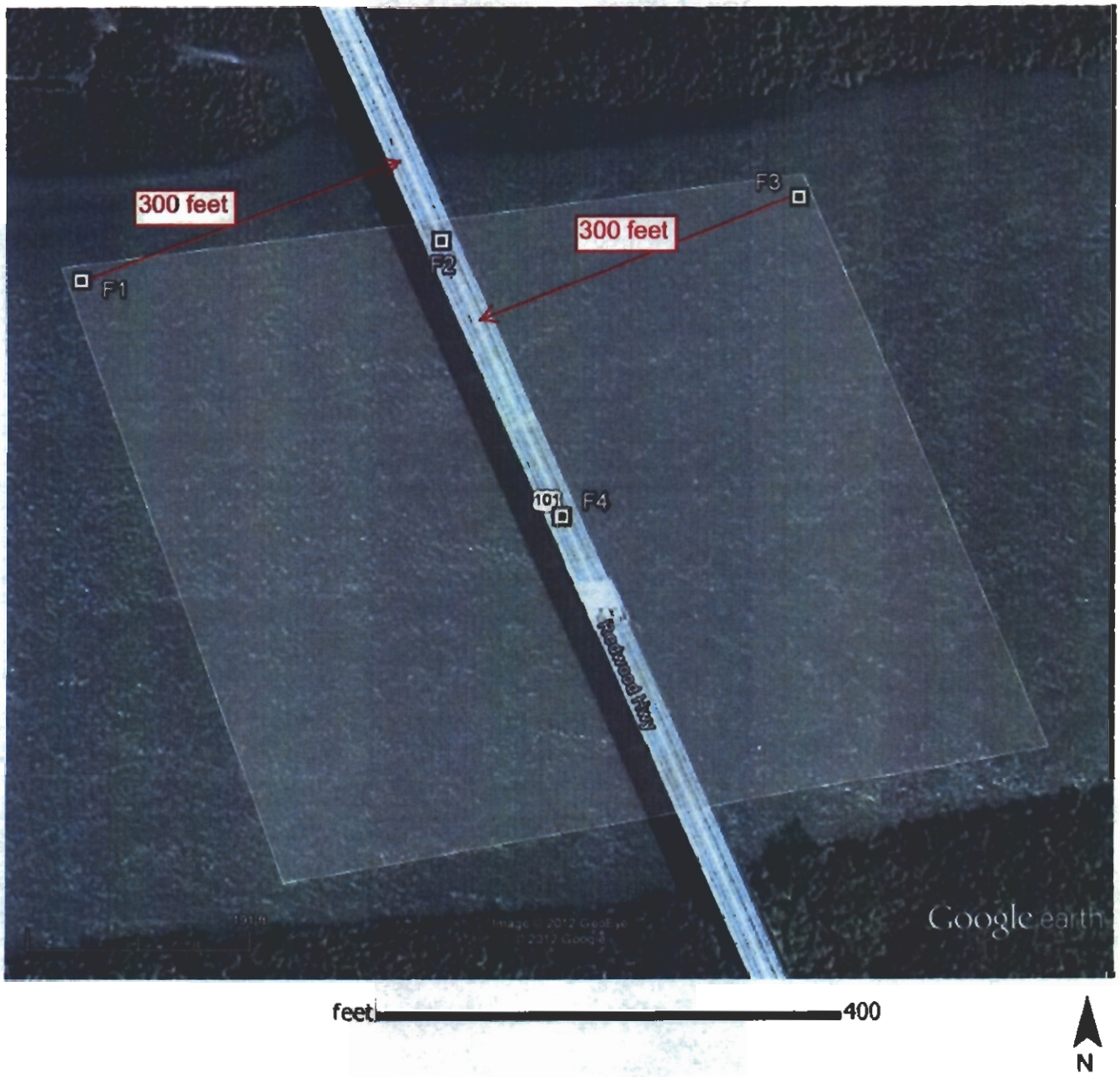


Figure 2. Proposed Fixed Noise Monitoring Positions and Variable Noise Monitoring Zone

Note: Positions F1 through F4 are fixed monitoring positions. Variable monitoring positions will be located within the highlighted polygon area with initial positions being closest to the northern shore (closest to Hinge 8). Variable monitoring positions will be at least 150 feet from any fixed position or previous variable position. Monitoring positions will be at locations where the water is at least 1 meter deep. The actual fixed positions shown here may change as necessary to ensure that the measurements are taken in water that is 1 meter deep. Positions F1, F2, and F3 will be as close to the northern shore as possible while maintaining 1 meter water depth.

State of California
Housing Agency
Department of Transportation

Business, Tran

EXHIBIT NO. 7
APPLICATION NO.
1-11-039-A1
CALTRANS
BIRD & BAT PROTECTIVE MEASURES INSTALLATION TIMING MEMO (1 of 5)

M e m o r a n d u m

To: Steve Croteau

RECEIVED
JUL 25 2012
CALIFORNIA
COASTAL COMMISSION

Date: July 24, 2012

File No.: 01-47690
DN 101 PM 4.04/4.42
Klamath River Bridge
Hinge Replacement Project

From: Carol Wilson, Biologist
Environmental Branch E2

Subject: Timing of Installation of Bird and Bat Protective Measures

This memorandum was prepared to address the timing of the installation of the bird and bat protective measures for the Klamath River Bridge Hinge Replacement Project located on United States Route 101 (Post Mile 4.04/4.42) in Del Norte County.

Background

Since the previous Bird and Bat Exclusion Plan was written, more extensive bird and bat surveys have been conducted and more data has been gathered (see below, under the specific headings for Swallows and Bats). This has refined Caltrans' knowledge of the timing of bird and bat use of the bridge.

Caltrans previously proposed that exclusion devices would be installed on the bridge hinges and box girders between November 15 and February 28, prior to the season of construction. This was a very conservative approach, well outside of the swallow and bat breeding seasons. However, it is now known that cliff swallows begin nesting in the area later than previously conjectured, and that bats inhabit the bridge at least into late October and as early as mid-May (with the potential of year-round use). Therefore, Caltrans would like to propose that swallow exclusion be installed by April15, with monitoring for nesting beginning in early March. If nesting begins before exclusion is installed, nests will be removed before swallows lay eggs in them. Nest construction usually takes 1 to 2 weeks. Egg-laying usually begins before the nest is completely finished.

Bat exclusion would be installed at the same time (by April 15), and will, as previously described, allow for the safe escape of bats already present on the bridge. At box girders and any hinges that serve as maternity roosts, no exclusion will be installed during the pup season, estimated to occur between late April and late August. Pups are non-volant (unable to fly and leave the roost) during this period. Inspections will be conducted prior to the installation of exclusionary measures and thereafter on a weekly basis, at a minimum, to ensure bats are not present.

By delaying the installation to April 15, exclusion will be up for a shorter period, and so subject to less weather and wear and tear, lowering the potential for any kind of accidental entrapment of birds and bats, as well as requiring less maintenance. Maintaining this exclusion and removing entrapped animals is logistically challenging, since it requires the use of special vehicles (i.e. snooper truck or scaffolding truck), and this equipment is not readily available (Caltrans has one vehicle of this type for the entire State).

Swallow and bat activity will be monitored by qualified biologists.

Synopsis of Cliff Swallow Timing on the Klamath River Bridge

During 2009-2011, regular surveys of the bridge area were performed June through September; surveys were not performed in April/May, so the exact timing of the first nesting may have been missed. The earliest documented nesting on the bridge was during the first week of June, when a "few" nests were active. Numbers of nests increased through late June, with nesting documented through mid-August (when a few nests still contained begging young) on the bridge.

Surveys in 2012 took place on May 15, June 14, 17 and 29, and July 12; during each of these surveys, only a few (i.e., < 10 individuals) cliff swallows were observed flying in the area, and none were observed on the bridge, or behaving interested in the bridge structure. No new nests were seen on the bridge, and no swallows were seen occupying or visiting the older nests or nesting sites on the bridge. By comparison, on June 29, a few cliff swallows were observed nesting on the Dr. Fine Bridge, 30 miles north of the Klamath Bridge, on US-101, over the Smith River. It appears that cliff swallows are not nesting on the Klamath Bridge this year.

Based on local expert birders' reports (eBird and Hunter et al. 2005), on average, the first cliff swallows arrive in the Humboldt/Del Norte coastal region in low numbers during early April. The earliest documented occurrence of cliff swallows in the region was a single swallow on March 23 near the Klamath River Bridge, but it was not nesting (C. Wilson, Caltrans). Cliff swallows continue to increase, and become common in mid-April, and peak in July. The earliest report of nesting in the region was April 9 (in Eureka), but nesting generally appears to begin in mid-May to mid-June.

Synopsis of Bat Timing on the Klamath River Bridge

During 2009-2011, surveys of the bridge were performed during early July through late October. Since surveys were not performed year-round, the exact timing of use and numbers of bats are unknown. In order to fill in gaps of our knowledge about timing, surveys have been ongoing since mid-May in 2012.

Even with more complete survey coverage, it may not be not be predictable how and when bats will use the bridge. As possible evidence of this, it appears a large number of bats have used some of the box girder interiors as communal roosts, based on a substantial and wide-spread amount of guano. This guano was fairly fresh (i.e., from the same year as the survey in October 2011) and of a uniform age, indicating it had not merely accumulated over years of use, but was from one season. Inside one of the box girders (adjacent to Hinge 8), the amount and pattern of guano indicated this area may have been a maternity roost. During 2012, we have so far found no evidence of large numbers of bats exiting from this box girder during exit surveys. It may be that females arrive later in the summer with pups here, and we will continue to monitor it.

Following is a summary of what we know about past bat use of the bridge in the vicinity of the hinge replacements.

Small numbers of bats use the bridge throughout much of the year. Bats (1-6 individuals) have been observed exiting Hinge 8 (our representative hinge, as it is the most accessible and observable) during the months of mid-May through late October. We have not surveyed the bridge outside of these months yet, and it is possible bats are present year-round. We will assume they are, unless future surveys show otherwise. We have also recorded bat calls and analyzed them during surveys in May through September. From these we have learned that nine species of bats are present in the vicinity of the bridge during different times of the year (see attached Table 1). Any of these species may use the bridge for roosting, with the exception of Pallid bat, which does not use structures for roosting. Also, as indicated above, there may be large numbers of bats that use the interior of the box girders for roosting and possibly as maternal colonies, but perhaps not consistently every year.

Based on these surveys and local expertise, it is probable that bats use the interior of the bridge during the spring-summer, and use the hinges during spring into early autumn, possibly later, or year-round.

If you have any questions regarding this memo, please contact me at (707) 441-3983.

Table 1. Bat species (identified by sonar calls) present in the vicinity of the Klamath River Bridge on US-101, Del Norte County. Only those species with a Discriminant Probability (see Note below) of ≥ 0.65 or sequence classification by vote of X out of X are reported.

	Species				
date	alpha code	scientific name	common name	Discriminant probability of correct id[1]	Sequence classification by vote
May 15, 2012	ANPA	*Antrozous pallidus*	Pallid bat	0.86	
	EPFU	*Eptesicus fuscus*	Big brown bat	0.70	
June 14, 2012	ANPA	*Antrozous pallidus*	Pallid bat	0.65	
	EPFU	*Eptesicus fuscus*	Big brown bat	0.68	
	LANO	*Lasionycteris noctivagans*	Silver haired bat	0.65	
	MYCA	*Myotis californicus*	California myotis	0.99	
July 12, 2012	EPFU	*Eptesicus fuscus*	Big brown bat	0.68	
	LANO	*Lasionycteris noctivagans*	Silver haired bat	0.80	
	MYCA	*Myotis californicus*	California myotis	0.87	
	MYCI	*Myotis ciliolabrum*	Western small-footed myotis	0.81	
	MYYU	*Myotis yumanensis*	Yuma myotis	0.93	
	TABR	*Tadarida brasiliensis mexicana*	Mexican free-tailed bat	0.20	1 of 1
September 1, 2011	MYYU	*Myotis yumanensis*	Yuma myotis	1.0	
	MYCA	*Myotis californicus*	California myotis	1.0	
	MYLU	*Myotis lucifugus*	Little brown myotis	1.0	
	LACI	*Lasiurus cinereus*	Hoary bat	1.0	
	LANO	*Lasionycteris noctivagans*	Silver haired bat	1.0	
September 15, 2011	ANPA	*Antrozous pallidus*	Pallid bat	0.88	

[1] Discriminant Probability = 1.0 does not indicate 100% confidence of the species classification result. Rather, it indicates that the quantitative parameters measured from the unknown call or sequence under consideration fall completely at the centroid of the multi-dimensional data space of all the data known for that species. A species with similar call characteristics can occasionally (or often depending on the overlap) produce call with data on the fringes of its parameter space that intrudes into the parameter space of another species, or even fall at the centroid of the other species' parameter space. But a DP = 1.0 PROBABLY indicates the classified species (Szewczak 2011).

CALIFORNIA COASTAL COMMISSION
NORTH COAST DISTRICT OFFICE
710 E STREET • SUITE 200
EUREKA, CA 95501-1865
VOICE (707) 445-7833
FACSIMILE (707) 445-7877

Hearing Date: February 9, 2012
Commission Action: **Approved with Conditions February 9, 2012**

ADOPTED FINDINGS

Amendment Application No.: **1-11-039**

Applicant: **California Department of Transportation**

Project Location: Klamath River Bridge, Highway 101, Del Norte County, south of the town of Klamath, 20 miles south of Crescent City, (between Post Miles 4.04 and 4.42).

Project Description: Repair three deteriorating hinges supporting the Klamath River Bridge and three 25-ft.-long sections of the bridge affected by construction, within the 2,080-ft.-long bridge. Work in the floodplain would be limited to June 15 - Oct. 15 annually, for three years, one hinge replacement per year, commencing in 2013. Work includes clearing vegetation and grading three 84 ft. x 110 ft. (9,240 sq. ft. or 0.21 acres per area) level work areas within the seasonally dry floodplain (up to 80 cu. yds. total grading per hinge location, with no import, export, or stockpile). Project includes placement and removal of temporary foundations and forms, demolition and replacement of the concrete surrounding the existing rebar (retained) within each hinge, and the replacement and re-sealing of each deck section. Demolition would be undertaken by battering the bridge structure with a hoe-ram attached to the arm of an excavator, a minimum of 140 feet from the wetted channel of the river. No access to the waters of the river, de-watering, or permanent fill of wetlands is proposed. No permanent increase in impervious surfaces would result; bridge rails and other visible features of the bridge would be reused or replaced in kind. Disturbed areas would be recontoured and seeded for erosion control immediately after construction; planting with native species would be completed during the rainy season of the following calendar year. One-way traffic control and up to 20 overnight bridge closures distributed over three seasons would be required. No alternate routes are available.

EXHIBIT NO. 8
APPLICATION NO.
1-11-039-A1
CALTRANS
EXCERPT, ADOPTED FINDINGS FOR CDP 1-11-039 (1 of 44)

Staff Recommendation: Approval with Special Conditions.

STAFF NOTES

1. Adopted Findings.

The Commission held a public hearing and approved the permit at the meeting of February 9, 2012. The adopted conditions for approval of the development differ from those contained in the written staff recommendation dated January 26, 2012. At the hearing, staff presented an addendum which revisions to the special conditions and findings to adjust the staff recommendation to reflect additional information received from the applicant. The Commission adopted the changes to the staff recommendation in their entirety. The full text of the original January 26, 2012 staff recommendation report the February 8, 2012 addendum revising the staff recommendation, and the report exhibits, can be accessed at the following URL:

http://documents.coastal.ca.gov/reports/2012/2/Th20b-2-2012.pdf

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I. RESOLUTION

The following resolution, conditions, and findings were adopted by the Commission on February 9, 2012 upon conclusion of the public hearing.

The Commission hereby approves the coastal development permit amendment on the ground that the development as amended and subject to conditions, will be in conformity with the policies of Chapter 3 of the Coastal Act. Approval of the permit amendment complies with the California Environmental Quality Act because feasible mitigation measures and/or alternatives have been incorporated to substantially lessen any significant adverse effects of the amended development on the environment.

II. STANDARD CONDITIONS

1. **Notice of Receipt and Acknowledgment.** 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 period of time. Application for extension of the permit must be made prior to the expiration date.

3. **Interpretation.** Any questions of intent or interpretation of any condition will be resolved by the Executive Director or 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. **Construction Standards & Responsibilities.** Construction-related standards and responsibilities shall include, but shall not be limited to, the following requirements and best management practices (BMPs):

   (A) The repair activities authorized by CDP 1-11-039 shall be undertaken between June 15 through October 15 annually, except as otherwise specified in the special conditions of CDP 1-11-039, and in accordance with the following requirements:

1. Hinge 8, located on the north end of the Klamath River Bridge, shall be repaired during the first construction season commencing June 15, 2013 and ending October 15, 2013 as proposed by Caltrans; Hinges 11 and 2 on the north and south ends of the Klamath River Bridge, respectively, shall be repaired during the June 15 – October 15 work windows of 2014 (Hinge 11) and 2015 (Hinge 2); and

2. All proposed and approved revegetation measures shall be implemented no later than the end of the rainy season of the year following the repair of each hinge; and

3. Erosion control re-seeding with approved mix shall be implemented immediately following site disturbance each season to stabilize and condition soils in preparation for the following year's restoration plantings; and

4. Night lighting shall be restricted to the end of the bridge where hinge replacement activities are underway, but lighting may also be used in the approved staging areas as needed, at the traffic control and flagging locations, traffic personnel stations, and at public service areas for waiting motorists and site personnel, and all lighting shall be minimized, shielded, and directed downward and away from sensitive habitat areas including occupied nests on the bridge and previously identified bat roosting locations and riparian corridor habitat outside of the active work area to the extent possible consistent with safety and adequate work progress; and

5. Refueling where spillage could reach the active channel, percussive demolition activities, or placement of wet construction materials with the potential to spill or run off into the active channel, shall not be undertaken during rainy weather or fog, or at night due to visibility limitations that would compromise adequate site monitoring or the implementation of emergency response measures; and

6. Disturbance associated with vegetation removal, grading, placement of bird/bat exclusion measures, demolition, or other construction-related activities shall be limited to the authorized active repair area of the subject bridge for that season except as otherwise specified herein; and

7. Site preparation activities such as vegetation removal and the placement of exclusion measures on the bridge that must be completed before nesting season commences may be undertaken prior to the annual construction season commencing on June 15, and shall be undertaken under the direct, continuous supervision of a qualified Caltrans biologist; and

(B) Bird and bats exclusion measures shall be installed on the bridge between February 1 and March 1 of the forthcoming construction season commencing

June 15 of that year, and shall be placed only on the end of the bridge subject to hinge repair during the forthcoming construction season. Exclusion measures shall be removed completely at the end of the pertinent season's construction activities or by October 15, whichever occurs first.

(C) **Prior to the commencement of construction**, the limits of the work areas and staging areas shall be delineated in cooperation with a qualified Caltrans biologist, limiting the potential area affected by construction and minimizing impacts to wetlands and other ESHA during construction. All vehicles and equipment shall be restricted to pre-established work areas and established or designated staging areas.

(D) All motorized equipment used at the project site shall be maintained in proper working condition and shall be free of drips and leaks of coolant and petroleum products.

(E) A spill prevention and clean-up kit shall be available on-site for immediate use in case of an accidental spill. Equipment or vehicles operated adjacent to or on the bridge deck above the Klamath River shall be limited to those immediately necessary to complete project work, and shall be checked and maintained daily to prevent leaks. All other vehicles, including those vehicles for the convenience of site supervisors, shall be parked in the approved staging areas away from the river.

(F) On-site refueling activities that pose a risk of fuel spill to coastal waters shall be limited to heavy equipment on the bridge such as cranes that cannot be readily relocated for fueling and to equipment that must be lowered to the work area by crane (such as bobcat, excavator, or fork-lift), and shall be subject to the following requirements:

1. Refueling activities shall be limited to daylight hours and weather conditions with sufficient visibility to ensure visual contact between the valve operator and the operator of the fuel discharge connection device; and

2. An additional worker shall be stationed at the shutoff valve at all times during refueling; and

3. The hose nozzle shall be contained in a bucket or other containment device when being moved between the fuel truck and the equipment to be refueled; and

4. Absorbent pads shall be placed beneath the fill tube and fuel tank to catch any drips or spilled fuel; and

5. Spill kits shall be maintained in close proximity to the refueling locations and shall be employed immediately in the event of a fuel spill.

(G) All trash and debris shall be disposed in the proper trash and recycling receptacles at the end of every construction day and in a manner that prevents access by wildlife.

(H) The applicant shall provide adequate disposal facilities for solid waste, including excess concrete, asphalt and paint scrapings, and other demolition or day-to-day construction wastes, which shall be stored separately from any lead or other contaminated soils or debris designated for hazardous waste disposal. Hazardous wastes shall be clearly marked and staged for proper removal and disposal within the staging areas away from the river, or elsewhere outside of the coastal zone where approved and permanently documented in the project files by the Caltrans resident engineer in charge of the project.

(I) Debris shall be disposed of at a legal disposal site or recycled at a recycling facility. If the disposal site is located in the coastal zone, a coastal development permit or an amendment to this permit shall be required before disposal can take place unless the Executive Director determines that no amendment or new permit is legally required; if the disposal location is outside of the coastal zone, the Caltrans resident engineer responsible for the project shall document in the permanent project records that the contractor has disposed of the debris or other construction wastes at a properly licensed disposal site or recycling facility.

(J) All stock piles of debris shall be covered, enclosed on all sides, shall be located as far away from the river or tributaries to the river as possible, and shall not be stored in contact with the soil and all construction materials shall be stored within the project area in a manner that protects soils within the work areas, and the waters of the river, from discharge.

(K) Machinery and equipment shall be maintained and washed off-site in confined areas specifically designed to control runoff. The applicant shall store, utilize, and dispose of thinners and solvents or other chemicals used in project activities in a manner that is consistent with applicable local, state, and/or federal laws and, under no circumstances shall they be discharged into coastal waters, or into septic, sanitary or storm sewer systems.

(L) The discharge of any hazardous materials into any receiving waters shall be prohibited. Concrete or other construction substance washouts shall not be undertaken at any location where runoff or rinsate may reach coastal waters. The Caltrans monitoring biologist and resident engineer shall identify and document in the permanent construction records the appropriate use of suitable facilities for these purposes.

(M) No fill of wetlands is authorized by this permit except as specified for temporary pad construction and for restorative grading for the purpose of site restoration after repairs are completed; no construction or fill, access by materials or equipment, or other discharge of any material within the waters of the Klamath River is authorized by this permit approval.

(N) Adequate stocks of stormwater runoff and erosion control barrier materials shall be kept onsite and made available for immediate use. Appropriate erosion, sedimentation, and runoff control devices shall be installed around all work areas and staging areas **prior to commencement of construction** and shall be maintained throughout the duration of construction activities, and inspected weekly by a Caltrans biologist, in addition to other inspections that may be routinely made by Caltrans or the Caltrans contractor, with inspection results included in the biologists' monitoring logs.

(O) If rainfall is forecast during the time construction activities are being performed, any exposed soil areas shall be promptly mulched or covered with plastic sheeting and secured with sand bagging or other appropriate materials before the onset of precipitation;

(P) Any and all debris resulting from demolition or construction activities, and any remaining construction material, shall be removed from the project site within 24 hours of completion of the project. Any debris accidentally discharged into coastal waters shall be recovered immediately and disposed of properly.

(Q) Best Management Practices (BMPs) and Good Housekeeping Practices (GHPs) designed to prevent spillage and/or runoff of demolition or construction-related materials, and to contain sediment or contaminants associated with demolition or construction activity, shall be implemented prior to the on-set of such activity.

(R) Upon completion of construction activities and prior to the onset of the rainy season, all disturbed areas shall be restored in accordance with the requirements specified in the approved plan required pursuant to Special Condition No. 2.

(S) Demolition activities relying on percussive impact techniques (such as battering with a hoe ram) shall only be undertaken when the nearest location of the Klamath River wetted channel is at least approximately 140 feet away from the impact point (the pertinent setback distance shall be determined in accordance with the requirements set forth in Special Condition 11) and shall be limited to daylight hours and weather conditions permitting visual monitoring of the Klamath River for a minimum distance of 300 feet up and down river, as measured from the nearest edge of the bridge deck. A qualified Caltrans biologist shall be on site continuously to monitor riverine habitat during all demolition activities deploying percussive techniques. The monitor shall direct that the Caltrans site supervisor stop work immediately if marine mammals are present and demolition activities shall not re-commence until marine mammals have

moved more than 300 feet from the bridge deck, or as otherwise authorized by a NOAA Fisheries biologist, and with the consent of the Executive Director. The biological monitor shall log all marine mammal sightings and behavioral observations, and provide weekly copies of the daily biological monitoring logs to the Executive Director and to NOAA Fisheries and other agencies requesting copies.

(T) Prior to the commencement of the bridge repair activities authorized by this permit, the permittee shall ensure that all on-site workers and contractors understand and agree to observe the standards for work outlined in this permit and in the detailed project description included as part of the application submittal and as revised by these conditions.

2. Final Erosion Control and Water Quality Protection Plan.

(A) **Prior to commencement of construction**, Caltrans shall submit for the review and approval of the Executive Director, a final Erosion Control and Water Quality Protection Plan based on the preliminary conceptual erosion control plan prepared by the Caltrans North Region Division of Landscape Architecture in a Caltrans Memorandum dated August 19, 2010 prepared by the North Region Division of Landscape Architecture and in accordance with the "Water Quality Assessment" dated August 10, 2010 prepared by Miguel Villicana, Caltrans NPDES Storm Water Coordinator, North Region Office of Environmental Engineering, and with the project description components and mitigation measures included in the "Erosion Control, Grading, Drainage and Water Pollution Control Plan dated September 20, 2011 prepared by Todd Lark, Project Engineer. (See Exhibit 6). The final plan shall be prepared by a licensed civil engineer with substantial training and experience in erosion control and water quality engineering principles and practices. The final plan shall additionally incorporate all of the pertinent requirements of Special Condition 1 set forth above, and shall include the requirement that an as-built plan showing all post-construction Best Management Practices implemented at the end of the final construction season be submitted to the Executive Director within thirty (30) days after completion or by November 15 of the final construction year. The required final report shall additionally document the stabilization of all disturbed soil areas, the backfilling and recontouring of excavation areas to return the areas to pre-project conditions, and the removal of all temporary BMPs from the project site, as proposed in the approved plan. If the report documents that any of the BMP measures identified in the plan failed to meet the objectives of stabilizing soils and returning disturbed areas to pre-project conditions following completion of construction, the permittee shall submit a revised or supplemental site-specific erosion and sediment control plan to compensate for those portions of the original plan that did not meet the post-construction plan objectives. Water quality (SWPPP or other) inspection reports shall be made timely available to Commission staff upon request.

(B) All project activities shall be conducted in accordance with the final Erosion Control and Water Quality Protection Plan approved by the Executive Director. Any changes to the final plan shall require an amendment of CDP 1-11-039 unless the Executive Director determines that no amendment is legally required.

3. Revegetation and Monitoring Plan.

(A) All project activities shall be undertaken in accordance with the "Klamath River Bridge Hinge Replacement Project Revegetation, Mitigation and Monitoring Plan" dated November 2011, and attached hereto as Exhibit 4, subject to the following changes which shall be incorporated into a final plan submitted for the review and approval of the Executive Director **prior to commencement of construction**:

- Both the plant palette and planting plan (Appendix A), and the success criteria should be organized according to revegetation areas. The quantity of plants, for example, should be specified for each area.
- More than one habitat type is specified for most areas. If these habitat areas are not coextensive, then the actual mosaic of habitats should be shown as polygons on a map.
- Rather than expressing success criteria in terms of percent survival, express these criteria as the actual number of plants that are to be present. This will automatically include any natural recruitment.
- Success criteria should include criteria for percent ground cover for each vegetation stratum.
- The success criterion for exotic species should be no more than 10% absolute cover rather than relative cover.
- Coyote bush should be removed from the planting palette for Hooker's Willow Riparian habitat or ecologically justified.
- Add the following language: "Final monitoring for success shall take place after 5 years or after 3 years with no remediation or maintenance other than weeding, whichever is longer."
- Add the following language: "If the final report indicates that the restoration project has been unsuccessful, in part or in whole, based on the approved success criteria, the permittee shall submit within 90 days a revised or supplemental restoration program to compensate for those portions of the original program which did not meet the approved success criteria. The revised restoration program shall be processed as an amendment to the coastal development permit unless the Executive Director determines that no permit amendment is legally required.

(B) Upon submittal of the final monitoring report, pursuant to the final revegetation, mitigation, and monitoring plan approved by the Executive Director, the Executive Director shall determine whether the restoration project has been successful, in part or in whole, based on the approved success criteria. If the

Executive Director determines that the restoration project has been unsuccessful, the permittee shall submit within ninety (90) days a revised or supplemental restoration program to compensate for those portions of the original program which did not meet the approved success criteria. The revised restoration program shall be processed as an amendment to the coastal development permit unless the Executive Director determines that no permit amendment is required.

(C) Any changes to the approved "Klamath River Bridge Hinge Replacement Project Revegetation, Mitigation and Monitoring Plan" shall require an amendment to CDP 1-11-039, unless the Executive Director determines that no amendment is legally necessary.

4. Protection of Archaeological Resources

(A) A monitor from the Yurok Tribe shall be present during all earth moving operations. If an area of historic or prehistoric cultural resources or human remains are discovered during the course of the project, all construction shall cease and shall not recommence except as provided in subsection (B) hereof, and a qualified cultural resource specialist shall analyze the significance of the find.

(B) A permittee seeking to recommence construction following discovery of the cultural deposits shall submit an Archaeological Plan for the review and approval of the Executive Director.

1. If the Executive Director approves the Archaeological Plan and determines that the Archaeological Plan's recommended changes to the proposed development or mitigation measures are *de minimis* in nature and scope, construction may recommence after this determination is made by the Executive Director. The Executive Director shall consider among other things, any additional excavation or grading necessary to recover or otherwise protect the discovered cultural deposits would be performed beyond the disturbance area footprint of the approved project, in making such a determination.

2. If the Executive Director determines that the changes to the proposed development or mitigation measures necessary to undertake the proposed Archaeological Plan are <u>not</u> *de minimis*, construction shall not recommence until after an amendment to this permit is approved by the Commission.

(C) The applicant, in preparing construction bidding documents for the subject project, shall include provisions requiring bidders to acknowledge and address potential construction schedule delays that may arise if discovery of cultural resources occurs during project activities. In accepting Coastal Development Permit 1-11-039, the applicant acknowledges and agrees that Caltrans/contractor project delivery schedules may be delayed to process an amendment made

necessary by the discovery of historic or cultural resources during project activities.

5. Hydroacoustic Impact Limits and Monitoring for Demolition of Hinge 8

(A) Demolition activities authorized by CDP 1-11-039 shall not produce sound exposure or sound pressure levels within the waters of the Klamath River in excess of either component of the dual metric exposure criteria listed below. To confirm compliance, each strike of the hoe-ram or other impact-based demolition equipment deployed during demolition of the first complete half width of Hinge 8 shall be counted, measured, and logged by the hydroacoustic monitor and the biological monitor and the recorded data retained in the permanent project records.

DUAL METRIC EXPOSURE CRITERIA:

1) SEL-accumulated:
The SEL-accumulated threshold shall be defined as an accumulated Sound Exposure Level (SEL) at or above 183 dB re one micropascal squared-second, measured and calculated in accordance with the simple summation procedure where Total SEL = Single Strike SEL + 10log(number of strikes), based on real-time hydroacoustic monitoring and calculation methods set forth in the monitoring plan required herein.

2) Peak SPL:
The Peak SPL shall be defined as the peak sound pressure level (SPL) at or above 206 dB re one micropascal from any single-impact strike of the hoe-ram against the bridge structure, based on real-time hydroacoustic monitoring as set forth in the monitoring plan required herein.

(B) By July 1, 2012, or within such additional time as the Executive Director may authorize for cause, Caltrans shall submit a Hydroacoustic Monitoring Plan for Bridge Demolition (hereinafter, "Plan") to the Executive Director for review and approval. Demolition shall not commence until the Executive Director has approved the final Plan incorporating any changes that the Executive Director may require, and the hydroacoustic monitoring program required by the final Plan is fully implemented.

At a minimum the Plan shall include the following:

1) A Caltrans employee authorized to direct the contractor undertaking demolition shall be on site during all demolition activities. Active demolition shall not commence until hydroacoustic monitoring personnel and equipment are deployed in accordance with the requirements of the final approved Plan and the Caltrans biological monitor is on-site and has verified that the hydroacoustic monitoring program is ready to commence.

All demolition activities associated with the demolition of the first complete half width of Hinge 8 that may produce sound exposure or sound pressure levels within the water column of the Klamath River shall only be undertaken at Hinge 8 while hydroacoustic monitoring is continuously undertaken. The Caltrans biological monitor shall be on site during all hydroacoustic monitoring; and

2) In the event of an exceedance of either criterion of the dual metric exposure criteria, all pertinent demolition operations shall be immediately stopped and shall not recommence unless the Executive Director, in consultation with the fisheries biologists of the California Department of Fish & Game and the National Marine Fisheries Service so authorizes based on the resumption of hydroacoustic monitoring of all pertinent demolition operations and the deployment of additional sound attenuation or other measures deemed likely by qualified technical experts to return the demolition operations to conformance with the duel metric exposure criteria;

3) If the return to demolition operations after the implementation of the additional measures discussed in Subparagraph (2) above results in an exceedance of either criterion of the dual metric exposure criteria, demolition operations shall be stopped immediately and shall not re-commence until or unless the Commission approves an amendment to CDP 1-11-039 that proposes substantial changes to the proposed project that are deemed by the Executive Director to offer a high likelihood of success in preventing further exceedance of the dual metric exposure criteria.

4) Hydroacoustic monitoring shall be implemented during all active demolition activities associated with the demolition of the first complete half width of Hinge 8, however activities that support demolition but could not transmit sound through the bridge structure or substrate (such as staging, grading, equipment setup) may be undertaken without hydroacoustic monitoring; and

5) The Plan shall describe a program of hydroacoustic monitoring capable of continuous assessment of the compliance of pertinent Hinge 8 demolition activities with the dual metric exposure criteria set forth above, including the plan for and maps of proposed hydrophone and personnel deployment, specified fixed and mobile locations for hydrophone placement (which shall include locations across a proposed transect at specified representative distances on the north, south and mid-river areas, as well as randomized mobile locations) and at a representative and adequate selection of locations up to 300 feet up and down-river from the bridge crossing of the river on a real-time basis, including the number, location, distances, and depths of hydrophones (which shall be located in

waters of at least one meter in depth), and associated monitoring equipment and personnel, the method of translating monitoring data into real-time direction, and the method of conveying critical data to the Caltrans site supervisor; and

6) Provide for continuously counting and recording demolition "strikes" in a manner that enables the time of each strike, the number of strikes, the length of time of any cessation of demolition within a work day, the peak sound pressure and other measures of sound energy per strike, or other information necessary to assess conformance with the dual metric criteria set forth above, and to otherwise adequately implement the Plan; and

7) Provide for daily logging of the hydroacoustic monitoring results by the Caltrans biological monitor, and daily submittal of summary reports to the Executive Director for the first week of demolition and weekly thereafter, unless non-compliance occurs or the Executive Director requests a different notification schedule. Non-compliance shall be reported immediately to the site supervisor, to the biological monitor and to the Executive Director. Any exceedance of the dual metric criteria shall be logged in the permanent project records, and in the biological monitoring reports; and

8) Provide procedures and contact information for notifying all pertinent parties of any failure to comply with the limits of the dual metric criteria, including the requirement that work stop immediately and not resume until the Executive Director authorizes resumption of work or until an amendment of CDP 1-11-039 is authorized by the Commission, unless the Executive Director determines that no amendment is legally required; and

9) Provide for submittal to the Executive Director of a final written hydroacoustic monitoring report prepared by the consulting acoustician within thirty (30) days after completion of Hinge 8 demolition. The report shall include but is not limited to the providing the hydrological monitoring data, any changes or problems with the field monitoring Plan, compliance with the dual metric criteria set forth above, and description of and assessment of efficacy of any adaptive measures that were implemented in the demolition activities as the result of the monitoring, or of any field adjustments of the monitoring Plan itself. The final report shall include an assessment of the monitoring plan and recommendations for changes or additions to future monitoring efforts. The final plan shall compare the predicted acoustic impacts of the Hinge 8 demolition with the actual measurements taken during the demolition activities. The report shall include a reconciliation of these comparative modeled and measured sound levels and provide recommendations for adaptation and/or improvement of future demolition modeling efforts, if applicable.

(C) Project activities shall be conducted at all times in accordance with the provisions of the final approved Plan and in accordance with any additional plan(s) for hydroacoustic monitoring that the Executive Director may require and authorize pursuant to the provisions of this special condition. Any proposed changes to the final approved Plan(s) shall be reported to the Executive Director. No changes to the final approved Plan(s) shall occur without an amendment to CDP 1-11-039 unless the Executive Director determines that no amendment is legally required.

6. Bird and Bat Exclusion and Protection Plan

(A) All project activities shall be undertaken in accordance with the "Bird and Bat Exclusion and Protection Plan for the Klamath River Bridge Hinge Replacement Project" dated December 2011, submitted by Caltrans on December 15, 2011 and attached hereto as Exhibit 5, and as required herein.

(B) All bird and bat exclusion measures selected shall be pre-approved and installed under the supervision of a qualified Caltrans biologist between February 1 and March 1 annually, and shall be limited to the location of the single hinge area scheduled for repair during the following construction season. Exclusion measures shall be removed upon completion of that season's construction activities or by October 15, whichever occurs first. All exclusion measures shall be checked daily for the first three days after initial installation, by a qualified Caltrans biologist, to ensure performance of the measure, and to ensure that no entrapment of birds or bats has occurred. If the measures are not performing adequately, or entrapment occurs, removal and release of trapped birds or bats shall be undertaken immediately by a qualified Caltrans biologist, and necessary repairs or adjustments implemented and monitored daily for an additional three days. The exclusion measures shall thereafter be inspected at least weekly, and shall be timely adjusted or repaired and replaced as necessary under the supervision of a qualified Caltrans biologist as needed to protect wildlife. During construction activities taking place near the exclusion areas, exclusion measures shall be adjusted to clear the area where demolition will remove a portion of the bridge and the areas of the bridge on each side of the demolition location will remain subject to exclusion measures until demolition is completed. The exclusion measures shall be checked daily by a Caltrans biologist during the active demolition and at least weekly thereafter until removed.

(C) Except as specified in Special Condition 6, any changes to the approved "Bird and Bat Exclusion and Protection Plan for the Klamath River Bridge Hinge Replacement Project" (Exhibit 5) shall require an amendment to CDP 1-11-039, unless the Executive Director determines that no amendment is legally necessary.

7. Evidence of Final State and Federal Authorizations and Approvals; Notifications of Bridge Closures

(A) **Prior to commencement of construction**, Caltrans shall submit evidence to the

satisfaction of the Executive Director (including copies of the pertinent final documents) that final approvals or authorizations of all state and federal agencies with review authority over the subject project have been received by Caltrans, including but not limited to authorizations by the California Department of Fish and Game, State Lands Commission, NOAA Fisheries, Yurok Tribal Water Quality Division, and the Army Corps of Engineers. The applicant shall inform the Executive Director of any changes to the project required by any state or federal agency. Such changes shall not be incorporated into the project unless the applicant obtains a coastal development permit amendment; unless the Executive Director determines that no amendment is legally required.

(B) Caltrans shall ensure that public notification or road closures shall be undertaken in accordance with the plan submitted by Caltrans on January 19, 2011, including the provision of such notice not less than two weeks before any bridge closure lasting more than two hours, and the provision of bottled water and portable toilets on site for stranded motorists during any bridge closure lasting more than two hours.

8. Construction Responsibilities

Caltrans, in accepting the benefits of CDP 1-11-039, agrees and accepts the following:

(A) Caltrans shall ensure that the relevant bidding documents and eventual contract include: a) sufficient and accurate provisions for Caltrans to ensure the obligation of the winning bidder to comply with all of the conditions of CDP 1-11-039 and to construct the project in accordance with the proposed and approved project description; and b) the specific 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 all related activities in full compliance with the project approved pursuant to CDP 1-11-039, 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 general and special provisions necessary to fully and accurately incorporate all requirements imposed by the Commission or other state or federal agencies with regulatory authority over the project, including timelines for review of documents and other potentially limiting measures that may affect construction scheduling and the timing of construction or other parameters of material interest to the participating parties. 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 1-11-039. A copy of the adopted findings for CDP 1-11-039 shall be attached to the bidding documents by Caltrans for reference by potential bidders; and

(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. 1-11-039, including but not limited to such activities as vehicle re-fueling near coastal waters, are fully informed of, and continuously comply with, the obligations established through the provisions of the approved permit, including all standard and special conditions and the requirements of all final plans approved in accordance with the pertinent special conditions. Nothing in these provisions shall prevent the Commission from taking enforcement action against the contractor or subcontractor(s) for non-compliance with the terms and conditions of CDP 1-11-039, either individually or in addition to enforcement action against Caltrans for such non-compliance; and

(C) All activities associated with performing the development authorized pursuant to CDP 1-11-039 shall at all times be undertaken in full accordance with the terms and conditions imposed by the Commission in conditionally approving CDP 1-11-039. It shall be Caltrans' responsibility to ensure such compliance by any party to whom Caltrans assigns the right to construct or undertake any part of the activities authorized herein; this requirement does not relieve other parties of responsibility for compliance with the permit or immunize such parties from enforcement action by the Coastal Commission's enforcement program.

9. Assumption of Risk

By acceptance of Commission approval of CDP 1-11-039, Caltrans acknowledges and agrees: that the Klamath River Bridge, including the bridge as repaired by the subject three hinge replacements and new segments of bridge and bridge surface treatments, may be subject to hazards from seismic events, tsunamis, 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.

10. Permit Expiration and Condition Compliance

Because some of the proposed development has already commenced, this coastal development permit shall be deemed issued upon the Commission's approval and will not expire. Failure to comply with the special conditions of this permit may result in the

institution of an action to enforce those conditions under the provisions of Chapter 9 of the Coastal Act.

11. Project Activity Limitations, Schedule, Biological Monitoring Plan

(A) Demolition activities (such as striking the existing bridge structure with a hoe ram or crane extension) shall only be undertaken when the location of the demolition point of impact on the structure is at least 140 feet from the nearest location of the wetted channel of the river, or in the case of demolition at Hinge 8, when the waters of the wetted channel are no closer to Hinge 8 than Pier 8. Otherwise, the pertinent setback distance shall be determined in the field as follows: From the closest point of the pertinent hinge repair area to the river, find the closest vertical bridge support (pier) toward the wetted channel; then find the point where that pier intersects the ground beneath the bridge; from the point of pier intersection with the ground at the edge of the pier closest to the river, measure horizontally to the nearest edge of the wetted channel. For purposes of this condition, the wetted channel shall be defined as the point where the waters of the river have reached the highest elevation during the previous 24 hours. This distance shall be maintained at a minimum of approximately 140 linear feet (pier to channel, as described herein). The elevation of the active channel may be lower (further from) this point at any given time due to the continuous fluctuations of tidal influence on the river elevations and the influence of seasonally fluctuating watershed hydrology; however, the controlling measurement remains the location of the wetted channel closest to the demolition site on a 24-hour basis. The pertinent measurements shall be made under the supervision of the Caltrans biological monitor, and recorded in the biological monitoring reports and in the permanent project records of the resident engineer.

(B) Demolition activities shall be limited to daylight hours and weather conditions permitting visual monitoring of the Klamath River for a minimum distance of 300 feet up and down river, as measured from the nearest edge of the bridge deck. A qualified biologist shall be on site continuously to monitor riverine habitat during all demolition activities deploying impact/battering or other sound-pressure-generating techniques. The monitor shall request, and the Caltrans site supervisor shall ensure that noise-generating activities stop immediately if marine mammals enter the 300-foot area up or downstream from the bridge. Once stopped, project activities shall not re-commence until marine mammals have moved more than 300 feet from the bridge deck, or as otherwise authorized by a NOAA Fisheries biologist, and in consultation with the Executive Director. The biological monitor shall log all marine mammal sightings and behavioral observations, and provide weekly copies of the daily biological monitoring logs to the Executive Director and to NOAA Fisheries and other agencies requesting copies.

(C) Activities undertaken within the floodplain of the river shall be limited to June 15 – October 15, annually, except as provided in Section (D) below. Hinge repair shall be undertaken one hinge location per season, commencing with Hinge 8 repairs on the north side of the bridge in the first construction year (2013),

followed by Hinge 11 repairs in the second construction season (2014), and finally by Hinge 2 repairs on the south side of the bridge during the third construction season (2015). Vegetation removal, grading, or other site disturbance shall be limited to the work area associated with the forthcoming season's repairs only (multiple hinge work areas shall not be cleared or graded in advance).

(D) Excepted activities that may be undertaken within the floodplain outside of the June 15 – October 15 time period shall be limited to:

1. February 1 – March 1 for site preparation such as vegetation removal that does not require grading, and the placement of bird/bat exclusion measures annually;
2. June 15 – Nov.15 annually for placement of deck sealant, with a 3-day dry weather forecast commencing from the date of sealant application, or as may be extended by the Executive Director for cause;
3. October 16 – June 15 annually, erosion control and revegetation measures that must be undertaken during the rainy season.

(E) **Prior to commencement of construction,** Caltrans shall submit a plan for biological monitoring by a Caltrans biologist or a qualified biologist retained by Caltrans (not retained by the Contractor), subject to the review and approval of the Executive Director. The monitoring plan shall include the monitoring schedule, logging and reporting provisions, and other measures necessary by the Executive Director, to ensure that project activities that may affect environmentally sensitive habitat areas and/or water quality are adequately monitored for compliance and for the purpose of identifying adaptive management measures for real-time resolution of compliance concerns that may arise during construction.

IV. FINDINGS & DECLARATIONS

The Commission hereby finds and declares as follows (and the information set forth in the staff summary is included by reference):

A. ENVIRONMENTAL SETTING

The site of the proposed project is the Highway 101 crossing of the Klamath River, in Del Norte County. The Klamath River Bridge is located just south of Klamath, an unincorporated community located approximately 20 miles south of Crescent City. The project is located within the boundaries of lands comprising the Yurok Tribe reservation.
(See Exhibits 1 – 3.)

The Klamath River is the second longest river in California, originating from Upper Klamath Lake in Oregon, where it travels more than 250 miles before emptying into the Pacific Ocean,

near Requa, California. Draining more than 15,000 square miles of area, the Klamath River (and its associated estuary, marine, tributary, wetland, and slough habitats) serves as vital habitat for state and federally endangered (and locally rare) Chinook salmon, coho salmon, steelhead trout, coastal cutthroat trout, green sturgeon, southern eulachon distinct population segment (DPS), tidewater goby and lamprey. Longfin smelt, currently in the process of being State-listed as threatened, was once considered abundant in the Klamath River Estuary, but the last record is of one smelt caught in March 2001. Northern red-legged frog, foothill yellow-legged frog, and southern torrent salamander are sensitive amphibian species with potential to occur in the area.

The project area is situated within California's northern coastal forest, with the topography of the area consisting of steep mountains and river flats. The climate is defined as Mediterranean, characterized by wet winters and dry summers. The Western Regional Climate Center data for Klamath Station indicates that the project vicinity receives 80 inches of rain per year and experiences average annual low and high temperatures of 45 and 61 degrees Fahrenheit, respectively. Due to the high rainfall and flashy conditions of the Klamath watershed, Caltrans proposes to undertake the subject construction activities (other than vegetation removal for site preparation, and the implementation of exclusion measures for bird and bat species using the areas of the bridge subject to demolition and replacement) during the June 15 - October 15 non-rainy season for three consecutive years commencing in 2013. One of the three hinges would be repaired in each season, starting with Hinge 8 at the north end of the bridge. The project schedule is designed to guard against the potential for the active river channel to reach the temporary bridge support areas.

Yurok ancestral lands

The project area is located within the ethnographic territory of the Yurok Tribe. Ancestral land of the Yurok Tribe extends from Damnation Creek (approximately 12 miles north of the Klamath River) to the Little River drainage basin (approximately 40 miles south of the Klamath River), and from the Pacific Ocean to the Klamath-Trinity River confluence vicinity to the east (approximately 25 miles inland). Currently the Yurok Reservation is composed of 63,035 acres and extends one mile on each side of the Klamath River from the river mouth to a distance of 44 miles upriver. The Yurok Tribe is the largest Native American Tribe in California, with nearly 5,000 enrolled members. The proposed project vicinity is considered sensitive for archaeological materials; Caltrans will ensure, and the special conditions require, that a Yurok cultural monitor or advisor is present during all ground-disturbing activities. Caltrans has also completed detailed surveys that indicate the discovery of such resources is highly unlikely within the areas proposed for bridge repair activities. Nevertheless, at the Yurok Tribe's request, Caltrans has prepared, and the Special Conditions address, a Native American Graves Protection Act and Repatriation Plan of Action, which outlines the steps to be taken in the event human burials and/or associated archaeological resources are discovered during construction consistent with permit requirements.

Klamath watershed; wetland habitat

Within the proposed project limits, the river corridor is approximately 650 feet wide, the topography is relatively flat (ranging from between zero and 40 feet above mean sea level), and the bridge is located approximately 3.5 miles upstream from the Pacific Ocean. The primary watersheds in the vicinity that drain into the river include the Hoppaw, Saugep, and Waukell creeks. The habitat along the river corridor in the bridge area consists mainly of mixed willow

scrub, sandbar willow scrub, *Rubus* scrub, red alder, and perennial grassland. A mature gallery of north coast black cottonwood (*Populus balsamifera*) occurs along the south bank of the river.

All areas subject to project-related grading and/or vegetation removal have been delineated as coastal wetlands (with a minor exception where an existing access road traverses the Hinge 8 work area). The hinge repair areas on the north side of the bridge crossing are dominated by weedy species such as Himalayan blackberry, plantain, wild radish, and various non-native annual grasses. (See Exhibit 4.) Spring and summer plant surveys were conducted in 2009. The surveys were timed to coincide with the periods during which many of the special-status plants that have the potential to occur in the area were blooming and identifiable. In addition to surveying for special-status plants, an inventory of all plant species present at the site was recorded. No special-status plants were found during the surveys or expected to occur within the project limits, according to Caltrans biologists.

Bird species using bridge and project area
The project area is used by numerous bird species for foraging, roosting, and nesting. However, during repeated avian surveys and other visits to the bridge site by biologists over a period of three years (2009 – 2012), only two bird species (cliff swallows and European starlings) were observed using the bridge structure itself.

Since construction-related activities would only occur on one or two hinges at one end of the bridge or the other during any one season, long sections of the bridge (the bridge is 2,038 feet long, each hinge work location is 25 feet long) would remain available for swallows to nest (exclusion measures would only be applied in the areas of the bridge subject to direct hinge repair work).

The little willow flycatcher, a state and federal species of special concern, was observed on the south side of the river by Caltrans biologists over several seasons of field studies. Due to confirming observations, the flycatcher will be assumed present during their normal migratory period, and any vegetation scheduled for removal that could potentially be suitable for flycatcher nesting, would be removed outside of the breeding season (between September 1 and February 28). A Caltrans maintenance crew clear-cut mature willow habitat on the south end of the bridge on August 22, 2011. The vegetation removal was undertaken without the benefit of a permit. Caltrans biologists surveyed the affected area and determined that willow flycatcher habitat was likely not present in the disturbed area. The after-the-fact vegetation removal in areas that would have been cleared for the hinge repair project has been included in the pending coastal development permit application.

Bat species using bridge
Caltrans biologists have also determined that at least five to six individual bats, and potentially more, use the bridge hinges as roosts. Possibly up to a few hundred bats use the interior of the box girders as day roosts and bats may also use the box girders as maternity colony roosts. Night roosting on the exterior of the bridge structure is also likely according to Caltrans biologists. Five species of bats have been positively identified as present in the vicinity of the bridge (Yuma myotis, California myotis, little brown myotis, hoary bat, and silver-haired bat). A sixth species, pallid bat, was identified as most likely being present; a seventh species, big brown bat, was identified as possibly being present. Caltrans has prepared a plan to exclude bats from the bridge areas affected by project construction, and a qualified Caltrans biologist would supervise all exclusion and/or removal measures. Caltrans notes that since only a limited segment of the bridge would be disturbed at any one time, the other bridge hinges would be available for roosting during construction. Additionally, there are several alternate roosting sites (large standing snags) in the vicinity of the bridge. (See Exhibit 5.)

Pacific fisher habitat not present
Pre-field investigation indicated that the Federal candidate listed Pacific fisher (*Martes pennanti pacifica,* Distinct Population Segment) could potentially exist in the project area. According to Caltrans biologists, on-site field investigations indicated that the area within the project limits does not contain suitable habitat for the Pacific fisher.

B. PROJECT DESCRIPTION

Caltrans proposes to replace three deteriorating hinges supporting the Klamath River Bridge, Highway 101, Del Norte County. The two-lane bridge was built in 1965. The bridge is 2,038 feet long and consists of twelve spans and four hinges that join the spans together.
The original hinge seats are only six inches wide (replacement hinge sections will be approximately two feet wide). Caltrans inspectors have determined that the hinges are exhibiting signs of fatigue; bridge inspection reports have noted cracking at all four hinges since at least 2001, and earlier reports also indicated that the integrity of the bridge hinges has been a long-term concern.

The four hinges contained within the bridge are numbered Hinge 2, Hinge 5, Hinge 8, and Hinge 11. The numbers are assigned in accordance with Caltrans' system of describing the first bridge abutment as Abutment 1 (commencing at the southerly end of the bridge), the first pier as Pier 2 (there is no Pier 1), with hinges taking the number of the most southerly adjacent pier. Thus, Hinge 2 follows Pier 2; Hinge 5 follows Pier 5, etc. Hinges 2, 8, and 11 – the hinges presently proposed for repair – are located over dry land under typical summer low flow river conditions. Hinge 5 (reconstructed) is located over the active river channel under all river flow conditions.

Hinge 5 previously replaced
In the winter of 2006, Caltrans reported that the hinge at span 5 (Hinge 5) experienced significant rapid settlement, requiring the replacement of the hinge under emergency contract. Caltrans requested an emergency CDP from the Coastal Commission, which was approved. However, after the permit was issued and reported to the Commission, Caltrans decided not to accept the conditions placed on the emergency permit, and constructed the repairs without

signing the permit or implementing some of the conditions. The unpermitted activities thereafter became the subject of an investigation by the Commission's enforcement program, and eventually the matter was resolved through the settlement of third party litigation in consultation with the Commission's enforcement staff. The manner of resolution obviated the need to process a regular follow-up up coastal development permit for the subject repairs. Caltrans is seeking a regular coastal development permit for the remaining hinges that require replacement (Hinges 2, 8, and 11), and hopes to avoid allowing the hinges to reach the stage of failure that would require another emergency response.

Because the remaining three hinges are located over dry land during typical summer/early fall conditions, Caltrans devised a plan to undertake repairs from the bridge deck and via separate access points at the north and south ends of the bridge. Caltrans proposes to repair the hinges on a three-year schedule, commencing with Hinge 8 at the north end of the bridge in 2013, and then repairing Hinge 11 (also at the north end of the bridge) in 2014. Hinge 2 at the south end of the bridge would be repaired last, in 2015. By relying on one-way traffic control and staging work off the bridge deck, Caltrans would avoid the need to install a temporary detour bridge crossing of the river, or the installation of temporary access roads (which would have required the removal of at least two acres of additional wetland vegetation, compared with the 0.55 acres of the subject proposal, according to Caltrans). A temporary bypass bridge would require pile-driving to install the necessary support structures within the river channel. Pile-driving has the potential to produce hydroacoustic impacts harmful to aquatic species, including numerous threatened and endangered fish that inhabit the Klamath River.

Caltrans indicates that the tradeoff for avoiding pile-driving or construction of substantial areas of new access roads within wetlands, is that one-way traffic control for three summers and some all-night bridge closures will be necessary, adding delays for summer travelers and inconveniencing local residents. Nevertheless, substantial project cost savings will result from avoiding construction of a temporary bypass bridge, and potentially harmful effects on aquatic species such as endangered salmonids will also be avoided. In addition, at least two acres of wetland fill will be avoided by using the cranes on deck to lower equipment to the work sites, instead of grading in new temporary access roads.

Description of work

As proposed by Caltrans, work (other than preliminary site preparation such as vegetation removal that must be completed before the beginning of nesting season) will occur during the dry months of summer and early fall (June 15 – October 15) annually, for three consecutive years. This schedule will avoid most significant rainfall events and the attendant hazards (such as river scour of temporary support structures that are not designed for winter inundation) that a rising river would pose to the job.

The Caltrans project engineer provided the following general description of the proposed work in a memorandum dated September 20, 2011:

Site preparation:

1. Traffic control: A traffic signal system for one-way reversible traffic will be installed either on the bridge, or immediately to the north and south of the bridge. The signal system would be removed or covered over the winter non-construction period.
2. Temporary fencing will be placed at the hinge work area below the bridge, to delineate the allowable work area for the Contractor.
3. Night closures will be allowed for crane(s) to deliver grading equipment, compactors, generators, and temporary foundation cribbing and temporary steel supports and falsework for the bridge.
4. Temporary barriers and cones or delineators will be placed on the bridge to close one lane of the bridge, while half of the hinge of the other lane is replaced.
5. Vegetation will be removed from the hinge work area below the bridge, and will be lifted to the bridge and disposed of outside the project limits at an authorized greenwaste disposal facility as approved by Caltrans, to minimize the potential for contamination by non-native species. The portion of the area for the temporary foundations will be graded flat. The temporary bridge support foundations are expected to be approximately 20 feet by 40 feet wide, and two of these foundations will be required to support the bridge at each hinge repair location. The falsework and foundations are expected to be approximately 20 feet by 40 feet wide to support the concrete forms for the hinge replacement.
6. Each hinge repair area would require grading level a work area of approximately 84 feet by 110 feet (9,240 sq. ft. or approximately 0.21 acres) within the floodplain. The grading would total up to 80 cu. yards per work area (20 cu. yds. cut, 20 cu. yds. fill to level the area, then re-grade the area back to original site conditions after repairs are completed in the subject section of the bridge).
7. Fiber rolls, drainage inlet protection, concrete washouts, and gravel bag berms will be placed for storm water best management practices.

Construction:

1. Wood or precast concrete and steel cribbing will be placed on the ground below the hinge work area. Workers will access the work areas below the bridge by crane man lift. The cribbing to support the weight of the bridge will be approximately 20 feet by 40 feet. Additional cribbing will be placed adjacent to the temporary bridge support cribbing for the purpose of supporting the falsework for the forms for replacing the hinge segment of the bridge.
2. Steel pipe (or wide flange) temporary bridge support frames will be welded together, set on the cribbing, and lifted into position either by crane, or forklift from the ground. Shop drawings and calculations from the Contractor will be reviewed for approval by Caltrans Engineers. Lighter falsework supports will be placed on the adjacent cribbing foundation for the purpose of demolishing and casting of the segment of the bridge to be replaced.
3. The temporary bridge support frames will likely be tested for several days to ensure that the bridge will be supported without settlement. Steel beam(s) will be placed under the bridge, and hydraulic jacks placed between the beams and the support frames, and the supported sections of the bridge will be lifted slightly above the existing hinge seats. Settlement of the bridge will be monitored, and lifted repeatedly until no settlement is observed.
4. Falsework supporting the forms for the 25-foot-long segments of the bridge to be replaced will be constructed while the temporary bridge support is tested. After the steel framed falsework is placed, a plywood or steel sheet deck will be placed on the falsework and

immediately under the bridge, and will extend beyond the edges of the deck to provide access from construction workers as well as debris catchment. The deck material will be cut and fitted on the closed highway lane on the bridge. Construction equipment remaining within the hinge work areas below the bridge will likely be lifted from the work areas and either removed from the project limits or to the vehicle/equipment maintenance area(s) north or south of the bridge.
5. After the temporary bridge supports have been tested and are supporting the bridge, and the forms for the hinge replacements are in place, half of the hinges (where the bridge is closed to traffic) will be demolished. Segments of the metal tube railing will be removed from the closed half of the bridge (and re-installed after bridge portion is replaced). The segments of concrete barrier will be broken up with jack hammers or hoe rams and pushed onto the deck, where it will be promptly removed into dump trucks and removed from the project limits. The upper deck segments will be demolished with jackhammers or hoe rams, and debris can fall to the soffit (bottom slab of the bridge) below, and will be removed from both the deck and lower bridge soffit. The vertical walls forming the bridge will be broken up and removed from the bridge soffit. The bridge soffit will be broken up, with debris falling to the falsework/formwork supporting the soffit, and promptly removed. All concrete debris will be swept and/or vacuumed to allow for the reconstruction of the bridge hinge.
6. Steel reinforcing bars and form boards will be placed on the falsework/formwork to create a new soffit. The concrete will be poured or pumped into place for the new bridge soffit. The concrete trucks and pumping equipment will be directed to the concrete washout in the equipment maintenance area off of the bridge for cleanup. Any concrete falling to the ground will be removed. Next, the approximately 8-1/2 foot tall walls supporting the deck will be formed, reinforcing will be placed and the concrete poured. The walls of the short spans supporting the long spans will be installed first, as the walls of the long span will rest on those of the short span segment of the bridge. The forms will be removed from the wall construction, and plywood forms will be placed below the finished deck, reinforcing will be placed and the deck will be poured, and the metal rails previously removed will be reinstalled.
7. After the hinges of one side of the bridge have been replaced, the temporary railings and cones (delineators) will be relocated, and the demolition and re-construction procedure will be repeated for the other side of the bridge hinges (steps 5 and 6).

Construction completion:
1. After the each hinge is replaced, the temporary bridge supports will be lowered to allow the short spans of the bridge to support the long span segments of the bridge. The falsework materials will be removed by crane up to the deck and removed. The temporary support frames will be disassembled and cut as necessary to remove, and will be removed by crane from the bridge deck. The cribbing material will also be removed by crane. A small tractor will be lowered to the hinge work areas and the "flattened" temporary foundation areas will be re-graded and re-contoured to conform to the pre-construction slopes. The grading equipment will be removed. The fiber rolls and temporary fencing will be removed by crane. The hinge work areas will then be re-planted.
2. The temporary barriers and cones/delineators will be removed, and the signal system will be removed.
3. The bridge will be swept clean, and soffit drains will be temporarily sealed, striping will be removed and a methacrylate deck sealant be placed onto the deck surface. This work will occur under flagging traffic control. New stripes will be placed on the bridge.

4. The construction equipment, temporary seals on the soffit drains, and the remaining storm water management items will be removed from the project to complete the construction work.

Service life of existing bridge extended by repairs
Caltrans states that the proposed project would replace the remaining cracked and aging hinges at post mile R4.09 (Hinge 2), R4.29 (Hinge 8), and R4.39 (Hinge 11) to extend the service life of the bridge, to prevent damage to the remainder of the structure and to conform to current hinge design and construction practices. The replaced hinges will be significantly wider and stronger than the original hinges. Hinge replacement includes application of methacrylate to the new deck surface after construction to seal and extend the life of the bridge. Bridge rails and other visible features of the bridge would be re-used or replaced in kind to match the existing bridge. The repairs may extend the service life of the bridge indefinitely; Caltrans engineers have estimated that repairs will provide a minimum of at least an additional 25 years of service life for the bridge.

Construction schedule
The project would be completed between June 15, 2013 (other than the February 1 through March 1 vegetation removal necessary for site preparation before the onset of annual nesting season and installation of bridge exclusion measures associated with the work area of that year's demolition and repair, work nearest the active river channel would not commence before June 15 in any construction year) and October 15, 2015, according to Caltrans. Final restoration plantings on the north side of the bridge would be installed during the rainy season of the year after the repairs of Hinges 8 and 11 are completed, and final restoration plantings on the south side of the bridge would be installed during the rainy season of the year following completion of repairs at Hinge 2, presently scheduled for completion by October 15 of 2016. Each hinge would be repaired in a single construction season, commencing with Hinge 8 at the north end of the bridge. The construction season could not be extended beyond October 15 in any construction year due to the hazards posed by rapidly rising waters in the Klamath, and the substantial difficulty of removing temporary supports and implementing erosion control measures in disturbed project areas.

Caltrans proposes to repair Hinge 8 during the first construction season (2013), followed by Hinge 11, and finally by Hinge 2, on the south side of the bridge. The locations of Hinges 8 and 11, as explained below, presently have significant areas of non-native invasive species in the proposed work areas. The hinges could not be repaired simultaneously without additional hydroacoustic impact analysis and hydroacoustic monitoring would be required to ensure protection of aquatic species during demolition; Caltrans indicates that it would be less expensive, and the schedule more reliable for timely annual completion (to avoid riverine hazards with the onset of the annual rainy season) to construct only one hinge repair per season.

Construction access will be from the bridge deck to minimize environmental and community impacts. Cranes on the bridge deck would lower equipment and materials into the specific work area where repairs are underway. Support for the repair area would be provided by temporary structures placed beneath the bridge, transferring bridge load temporarily so that the subject hinge may be taken out of service and replaced. The season's activities would include constructing the necessary support pads, placing support structures, demolishing and replacing

each 25-foot bridge section (including installing the new hinge and resurfacing the associated section of the bridge deck and replacing rails and other features), restoratively grading the pads and access roads back to natural, pre-construction contours, installing the approved native plants for restoration/enhancement of the affected areas, and installing erosion control measures to protect the new plantings and previously disturbed soils.

Timing limitations
As noted previously, extensions of time beyond the annual October 15 deadline (to extend the construction season) in any year would not be appropriate for several reasons: a) because river changes may occur suddenly with heavy rainfall and with catastrophic consequences if the temporary bridge supports at any hinge location are undermined by river scour; b) to ensure sufficient time to perform restorative grading and complex site revegetation and enhancement measures proposed by Caltrans before the onset of rainy season; and c) to ensure sufficient time to remove exclusion measures and to install final site erosion control measures after all other activities have been completed for the subject season. Caltrans water quality and environmental engineering staff notes that significant precipitation events often occur during the first half of October, further reinforcing the need to timely complete all seasonal activities by October 15 annually.

In keeping with these considerations, Caltrans proposes and the special conditions require that each hinge be repaired in a single, separate June 15-Oct.15 construction season, commencing in 2013 and ending in 2015. Caltrans has explained that this limitation is designed in part to ensure that key, incremental work milestones are completed within the pertinent time limits of a dry season construction window and to ensure that disturbance of bridge nesting/roosting habitat used by bird and bat species occurs on only one side of the river at a time. In addition, according to Caltrans staff, the total work required by the proposed project could not with certainty be completed in a single construction season without impermissibly doubling up the demolition activities and potentially increasing the risk of hydroacoustic impacts, as well as increasing the risk of significant disturbance to bridge nesting/roosting migratory birds and bats. Caltrans therefore determined that combined demolition locations would not be proposed and that construction would be undertaken one hinge per season during the restricted dry season window of each of three consecutive years, commencing in 2013.

Fill of coastal wetlands, subsequent restoration, enhancement, limits on maintenance
Caltrans proposes to support the bridge during repairs by constructing three level pads (approximately 1,600 sq. ft.) for bridge support while each hinge is out of service, within an overall 84 x 110 sq. ft. work area that must be graded level for equipment operations, materials, etc. within each hinge repair area. The total grading per hinge repair area requires up to approximately 80 cu. yds., within areas mostly delineated as coastal wetlands.

Temporary bridge supports would be installed and subsequently regraded to pre-construction contours at completion of each year's construction or by October 15, at the latest. The subject disturbed area (and other areas of the site subject to the proposed restoration activities) would be reseeded for erosion control immediately after construction, then revegetated with ecologically appropriate, locally native plant species during the rainy season of the following calendar year. Caltrans estimates that the total area of directly affected wetland vegetation would be

approximately 0.55 acres for the overall project. In addition to restoring the disturbed work areas with a palette of native plant species, including the hinge areas that are presently populated by mostly non-native invasive species, Caltrans proposes to restore an additional 0.79 acres of habitat adjacent to the bridge, between Hinges 8 and 11. The plant palette has been designed to rely on appropriate, locally native species that will mature to heights of not more than twenty feet. Caltrans has agreed to limit maintenance trimming of vegetation near the bridge provided the vegetation does not exceed 20 feet in height, thus enhancing the habitat functions and ecological value of the restored habitat areas by limiting recurring disturbance that would otherwise diminish the habit value of the restored areas near the bridge. Aggressive control of non-native invasive species in the bridge corridor would be part of the overall effort to enhance habitat values, and to improve the establishment success of slower-growing native plant species. (See Exhibits 4 and 7)

Demolition

The project would not include any pile-driving activities (which can transmit sound impacts to adjacent underwater habitat, even when undertaken from adjacent upland locations). The proposed project does, however, include demolition of the failing hinge locations by means of hoe-ram battering. Demolition-related battering (percussive) activities have been shown to generate hydroacoustic impacts within nearby waters in some situations, and approximate the sound levels generated by pile-driving of concrete piles. Therefore, at the request of Commission staff, Caltrans retained a qualified engineer/acoustician to analyze the potential hydroaoustic impacts of the proposed demolition activities. The pertinent calculations demonstrate that, provided the nearest location of the wetted channel is at least 190 feet from the nearest demolition impact location, sound pressure levels calculated for one demolition location at a time should remain below the thresholds that have been established to protect fish from adverse biological effects.

Marine mammals may suffer behavioral effects at lower sound pressure thresholds than the levels known to pose a risk of physical harm to fish; therefore monitoring by a qualified biologist to ensure that marine mammals are not present in the river during demolition activities will be required. The special conditions limit demolition activities to a minimum of 190 feet from the nearest edge of the wetted river. If river flows are higher than normal, the onset of construction activities could be delayed and the work schedule would be adjusted accordingly. The presence of marine mammals could also delay the project schedule. Due to the uncertainties posed by these factors, the necessary work could require three consecutive seasonal construction windows for project completion.

Best Management Practices

The applicant's project description includes a list of mitigation measures and "best management practices" (BMPs) to protect water quality and other coastal resources. These include the following:

- A qualified biologist would flag the delineated wetlands adjacent to work areas prior to commencement of construction;
- Prior to the start of work, a job-site tailboard would be conducted to inform workers of the necessary conservation measures and BMPs;

- All personnel and equipment within the Klamath River corridor would be required to remain within the authorized work areas and outside of other wetlands at all times during project activities;
- A revegetation plan using a Caltrans-approved seed mix would be prepared to restore the excavated areas to the current conditions following project completion, including measures to restoratively grade and re-contour excavated topsoil;
- Sediment control measures (such as silt fencing, fiber rolls, gravel bag berms, sand bag barriers, storm drain inlet protection, tracking controls, and stockpile management) would be in place to ensure that any excavated material would not enter adjacent wetlands or waters during construction;
- Any signs of soil contamination during the excavation process would result in the immediate stop of work;
- Construction activities would be scheduled to occur in the dry season to prevent runoff and sedimentation into adjacent wetland and river channel areas;
- All proposed project activities, including excavation and equipment/vehicle staging and storage, would remain within the authorized work areas within the Klamath River corridor, and within other authorized areas contained within the Caltrans right-of-ways and designated public service facility areas;
- All motorized equipment used at the project site would be maintained in proper working condition and would be free of drips and leaks of coolant and petroleum products; and
- A spill prevention and clean-up kit would be available on-site for use in case of an accidental spill. Any equipment or vehicles operated adjacent to the slough would be checked and maintained daily to prevent leaks.

Plans concerning sensitive coastal resources

In addition, the applicant has prepared various plans that include specific measures to avoid or minimize project impacts on coastal resources. These include a "Project Revegetation, Mitigation and Monitoring Plan," letters of additional information concerning vegetation and habitat impacts and project commitments dated November 10 and December 14, 2011 (combined, Exhibit 4), "Bird and Bat Exclusion Plan" (Exhibit 5), and "Erosion Control, Grading, and Water Pollution Control Plan" (Exhibit 6). The Erosion Control Plan includes specific BMPs for erosion control, sediment control, tracking control, wind erosion control, non-stormwater control (including operations, equipment and vehicle washing, etc.), waste management and materials pollution control, and post-construction stormwater management. The Revegetation Plan includes specifications for materials and installation methods, measures to remove and control non-native invasive species, performance milestones and some reporting requirements to ensure that disturbed as well as previously degraded wetland habitat would be restored and managed in a manner that will provide the equivalent of approximately 3:1 mitigation within the Caltrans right-of-way near the bridge. The permit application submitted by Caltrans also includes extensive, negative cultural resource survey reports prepared by a qualified Caltrans archaeologist as well as plans prepared in accordance with federal laws and

the requirements of the Yurok tribal authorities in the event that cultural remains are discovered during project grading.

C. PERMIT AUTHORITY, EXTRAORDINARY METHODS OF REPAIR & MAINTENANCE

Coastal Act Section 30610(d) generally exempts from Coastal Act permitting requirements the repair or maintenance of structures that does not result in an addition to, or enlargement or expansion of, the structure being repaired or maintained. However, the Commission retains authority to review certain extraordinary methods of repair and maintenance of existing structures that involve a risk of substantial adverse environmental impact as enumerated in Section 13252 of the Commission regulations.

Section 30610 of the Coastal Act provides, in relevant part (emphasis added):

> *Notwithstanding any other provision of this division, no coastal development permit shall be required pursuant to this chapter for the following types of development and in the following areas: . . .*
>
> *(d) Repair or maintenance activities that do not result in an addition to, or enlargement or expansion of, the object of those repair or maintenance activities; provided, however, that if the commission determines that certain extraordinary methods of repair and maintenance involve a risk of substantial adverse environmental impact, it shall, by regulation, require that a permit be obtained pursuant to this chapter.*

Section 13252 of the Commission administrative regulations (14 CCR 13000 *et seq.*) provides, in relevant part (emphasis added):

> *For purposes of Public Resources Code section 30610(d), the following extraordinary methods of repair and maintenance shall require a coastal development permit because they involve a risk of substantial adverse environmental impact:...*
>
> *(3) Any repair or maintenance to facilities or structures or work located in an environmentally sensitive habitat area, any sand area, within 50 feet of the edge of a coastal bluff or environmentally sensitive habitat area, or within 20 feet of coastal waters or streams that include:*
>
> *(A) The placement or removal, whether temporary or permanent, of rip-rap, rocks, sand or other beach materials or any other forms of solid materials;*
>
> *(B) The presence, whether temporary or permanent, of mechanized equipment or construction materials.*
>
> *All repair and maintenance activities governed by the above provisions shall be subject to the permit regulations promulgated pursuant to the Coastal Act, including but not limited to the regulations governing administrative and emergency permits. The provisions of this section shall not be applicable to methods of repair and maintenance undertaken by the ports listed in Public Resources Code section 30700 unless so provided elsewhere in these regulations. The provisions of this section shall not be applicable to those activities specifically described in the document entitled Repair, Maintenance and Utility Hookups, adopted by the Commission on September 5,*

> *1978 unless a proposed activity will have a risk of substantial adverse impact on public access, environmentally sensitive habitat area, wetlands, or public views to the ocean....*

The proposed project is a repair and maintenance project because it does not involve an addition to or enlargement of the subject highway bridge, which was originally installed in 1965. Although certain types of repair projects are exempt from CDP requirements, Section 13252 of the regulations requires a coastal development permit for extraordinary methods of repair and maintenance enumerated in the regulation. The proposed repair work involves the placement of construction materials and removal and placement of solid materials within 20 feet of coastal waters and within 50 feet of ESHA (wetland habitats). The proposed repair project therefore requires a coastal development permit under CCR Section 13252(a)(1).

In considering a permit application for a repair or maintenance project pursuant to the above-cited authority, the Commission reviews whether the proposed method of repair or maintenance is consistent with the Chapter 3 policies of the Coastal Act. The Commission's evaluation of such repair and maintenance projects does not extend to an evaluation of the conformity with the Coastal Act of the underlying existing development.

The repair and maintenance of the deteriorating bridge hinges, such as is proposed under the subject CDP application, can have adverse impacts on coastal resources, in this case primarily coastal wetlands and coastal waters within and adjacent to the project area, and bridge nesting/roosting species, if not properly undertaken with appropriate mitigation. As described above, the applicant proposes to repair and maintain the Klamath River Bridge crossing of U.S. Highway 101 in its existing footprint by accessing the hinge locations of concern via mostly existing access roads, and off the bridge deck. Heavy equipment will be necessary to grade level pads for placement of temporary bridge supports while the three respective hinges are removed and replaced and the bridge surface reconditioned and sealed after construction.

The applicant has included a number of mitigation measures as part of its proposal, as discussed above, such as flagging adjacent wetlands and sensitive habitats for avoidance, using various sediment control and spill prevention measures, and revegetating and restoring disturbed areas to conditions that in some areas would be of greater ecological value that pre-project conditions. Although these and other measures proposed by Caltrans are appropriate, the Commission finds that additional measures are needed to avoid or minimize potential project impacts on water quality, adjacent wetland habitats, sensitive species, and archaeological resources and ensure that the development is consistent with Coastal Act policies protecting these resources. Other special conditions are necessary to include assumption of risk protection, and to memorialize future maintenance limitations agreed upon by Caltrans within the bridge corridor. The conditions required to meet these standards are discussed in the following findings relevant to water quality, marine resources, ESHA, and archaeological resources. Therefore, as discussed in these Findings, the Commission finds that the proposed project as conditioned is consistent with all applicable Chapter 3 policies of the Coastal Act.

D. PROTECTION OF WATER QUALITY & ESHA

Section 30230 of the Coastal Act states as follows:

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 30231 of the Coastal Act states as follows:

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.

Section 30232 of the Coastal Act states as follows:

Protection against the spillage of crude oil, gas, petroleum products or hazardous substances shall be provided in relation to any development or transportation of such materials. Effective containment and cleanup facilities and procedures shall be provided for accidental spills that do occur.

Section 30233 of the Coastal Act, in pertinent part, requires the evaluation of alternatives to the proposed project, and the adequacy of proposed measures to lessen or mitigate impacts to wetlands as follows:

(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...

Section 30240 of the Coastal Act states, in applicable part, as follows:

(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.

Section 30107.5 of the Coastal Act defines "environmentally sensitive area" (ESHA) as follows:

"...any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments.

As discussed above, the project area adjacent to the highway bridge is located within delineated wetlands and riparian habitat adjacent to the Klamath River. These adjacent coastal wetlands and waters provide habitat for a number of marine species, including rare, threatened, or endangered species such coho and Chinook salmon, steelhead trout, and the bridge structure itself provides

nesting and roosting habitat for migratory birds and bats, and other species. These adjacent coastal waters and wetland habitats constitute ESHA under the Coastal Act.

As cited above, Section 30240(b) of the Coastal Act requires that development in areas adjacent to ESHA shall be sited and designed to prevent impacts which would significantly degrade the ESHA and that permitted development shall be compatible with the continuance of the adjacent ESHA. Sections 30230 and 30231 of the Coastal Act require in part the maintenance of the biological productivity and quality of marine resources, coastal waters, streams, wetlands, and estuaries necessary to maintain optimum populations of all species of marine organisms and for the protection of human health. Section 30232 of the Coastal Act requires that permitted development provide for the protection against the spillage of crude oil, gas, petroleum products, or other hazardous substances and that effective containment and cleanup facilities and procedures be provided for accidental spills that may occur. Section 30233 of the Coastal Act requires in part that wetland fill may only be approved when there is no feasible less environmentally damaging alternative and when feasible mitigation measures have been provided to minimize adverse environmental effects.

Implementation of the proposed work will result in the repair of an existing highway bridge, within the existing footprint, the removal of vegetation and grading of soils for construction of support pads, the use of existing level graveled areas adjacent to the highway for staging areas for vehicles and equipment and for material and demolition debris stockpiling, and the construction of concrete washout holding basins for management of rinsate during hinge repair work. Because development is proposed within and adjacent to wetlands and riparian vegetation, there is a potential for project activities to adversely impact the water quality and habitat function of these environmentally sensitive habitat areas. Unless appropriate protocols are followed, the proposed work could result in sediments or other pollutants entering coastal waters and wetlands, improper storage of materials in or adjacent to sensitive areas, accidental leaks of coolants and petroleum products in close proximity to marine waters and ESHA, and other activities that could have adverse impacts on water quality, marine resources, and ESHA adjacent to the project site.

The applicant has proposed a number of protocols to protect water quality and sensitive habitats and species, as detailed in the Restoration Plan (Exhibits 4 and 7), Bird and Bat Plan (Exhibit 5) and the Erosion Control Plan (Exhibit 6). **Special Conditions 1, 2, 3, 6,** 7 and **11** require but are not limited to the implementation of the measures set forth in these plans.

The Erosion Control Plan proposes a number of specific BMPs, including, but not limited to, the following:

- Erosion Control: The plan proposes to control erosion by scheduling development during the non-rainy season, delineating work areas with temporary fencing or other barriers to preserve existing adjacent vegetation, re-seeding disturbed areas following construction, and using erosion control devices to prevent erosion and stormwater runoff.
- Sediment and Tracking Control: The plan proposes the use of fiber rolls and gravel bag berms around excavation areas to intercept sheet flows and control sediment on

the construction site and street sweeping and vacuuming to prevent or reduce the tracking of sediment offsite by vehicles leaving the construction area.

- Wind Erosion Control: The plan proposes to use dust control as necessary, limit off-road vehicle traffic to 15 miles per hour, and stockpile management (see below) to control wind erosion on the construction site.
- Non-stormwater Control: The plan proposes BMPs for water conservation, dewatering operations (as described above in the "Project Description" Finding), monitoring for illicit discharges or dumping, vehicle and equipment washing (to be limited to off-site facilities only or at least 50-feet from ESHA in prescribed, lined and bermed concrete washout basin), vehicle and equipment fueling (to be done off-site only or with the use of absorbent pads and spill response equipment and other prescribed protocols should on-site fueling be necessary for stationary equipment such as cranes), and vehicle and equipment maintenance (to be done off-site only or in designated areas only and with spill response equipment should on-site maintenance be necessary).
- Waste Management and Materials Pollution Control: The plan proposes procedural and structural BMPs for the handling, storing, and disposing of solid, sanitary, concrete, hazardous, and equipment-related wastes. This section of the plan proposes covering and installing erosion control devices around stockpiles, maintaining spill response equipment on site, properly containing and disposing of all trash and debris, prohibiting the storage of bulk lubricating oil, hydraulic fluids, and other materials used for vehicle and equipment maintenance at the construction site, hauling away and properly disposing of any contaminated soils encountered, and other BMPs.
- Post-Construction Stormwater Management: Following completion of construction, the plan proposes to stabilize all disturbed soil areas, to backfill excavation areas and recontour them to pre-project grade, and to remove all temporary BMPs from the project site.
- Monitoring: Project activities that may affect sensitive species or habitat require monitoring or supervision by a qualified biologist employed or retained by Caltrans

The Commission finds that the comprehensive erosion and sedimentation control measures proposed by the permittee's erosion control plan are appropriate and will be effective in protecting water quality and sensitive habitats and species provided certain additional measures are added to the plan. Therefore, the Commission attaches **Special Condition 2** requiring that Caltrans submit a final erosion control and water quality protection plan that (a) incorporates certain additional best management practices specified in **Special Condition 1** as discussed below, and (b) includes a provision for submittal of a post-construction "as-built" final report to the Executive Director within 30 days of completion of construction. The final report is to document the stabilization of all disturbed soil areas, the backfilling and recontouring of excavation areas to return the areas to pre-project conditions, and the removal of all temporary BMPs from the project site, as proposed in the approved plan. If the report documents that any of the BMP measures identified in the plan failed to meet the objectives of stabilizing soils and returning disturbed areas to pre-project conditions following completion of construction, the

permittee shall submit a revised or supplemental site-specific erosion and sediment control plan to compensate for those portions of the original plan that did not meet the post-construction plan objectives. The revised or supplemental site-specific erosion and sediment control plan shall be processed as an amendment to this coastal development permit, unless the Executive Director determines that no amendment is legally required.

The Commission's senior staff ecologist, John Dixon, Ph.D. has reviewed the revegetation plan proposed by Caltrans (Exhibit 4), and has determined that, in general, and with some revisions or clarifications listed below, the protocols proposed by the applicant are comprehensive and appropriate to protect water quality and adjacent ESHA. Dr. Dixon has provided the following specific recommendations, and all of his recommendations have been incorporated into Special Condition 3:

- Both the plant palette and planting plan (Appendix A of the plan), and the success criteria should be organized according to revegetation areas. The quantity of plants, for example, should be specified for each area.
- More than one habitat type is specified for most areas. If these habitat areas are not coextensive, then the actual mosaic of habitats should be shown as polygons on a map.
- Rather than expressing success criteria in terms of percent survival, express these criteria as the actual number of plants that are to be present. This will automatically include any natural recruitment.
- Success criteria should include criteria for percent ground cover for each vegetation stratum.
- The success criterion for exotic species should be no more than 10% absolute cover rather than relative cover.
- Coyote bush should be removed from the planting palette for Hooker's Willow Riparian habitat or ecologically justified.
- Add the following language: "Final monitoring for success shall take place after 5 years or after 3 years with no remediation or maintenance other than weeding, whichever is longer."
- Add the following language: "If the final report indicates that the restoration project has been unsuccessful, in part or in whole, based on the approved success criteria, the applicant shall submit within 90 days a revised or supplemental restoration program to compensate for those portions of the original program which did not meet the approved success criteria. The revised restoration program shall be processed as an amendment to the coastal development permit unless the Executive Director determines that no permit amendment is required.

The Commission staff ecologist has also evaluated the after-the-fact vegetation removal, the proposal to accomplish approximately 3:1 mitigation ratio for native plant habitat disturbed by the project, through revegetation of all disturbed areas (including an additional 0.79 acres of degraded habitat that is not part of the disturbed area, located between Hinges 8 and 11), and including the commitment explained by Caltrans to limit future maintenance trimming of the habitat adjacent to the bridge where vegetation does not exceed twenty feet in height, and has determined that the proposed mitigation is adequate.

The Commission notes that only the after-the-fact vegetation removal necessary for the hinge repair activities is covered by the subject mitigation measures. The additional vegetation removal undertaken by the Caltrans maintenance crew in August of 2011 within the Klamath Bridge corridor that was not necessary for the hinge repair project is not covered by these provisions or

authorized by CDP 1-11-039. Caltrans has proposed to submit a separate coastal development permit application for these activities.

The Commission finds that the protocols proposed by the applicant in the submitted Restoration Plan (Exhibit 4) as revised in accordance with the recommendations of the Commission staff ecologist are comprehensive and appropriate to protect water quality and adjacent wetland habitats, and to restore the affected river corridor in a manner that will limit habitat disturbance otherwise necessary for future maintenance. Therefore, the Commission attaches **Special Condition 3** to require that Caltrans undertake development in conformance with the Revegetation Plan as revised in accordance with the requirements of the special condition.

In addition, **Special Condition 11** specifies construction schedule limitations and biological monitoring requirements necessary to ensure the full protection of sensitive coastal resources that may be affected by the proposed project.

Therefore, for all of these reasons, the Commission attaches **Special Conditions 2, 3, and 6** to require that Caltrans undertake development in conformance with the approved final versions of the Revegetation, Bird and Bat Plan, and the Erosion Control Plan (Exhibits 4, 5, 6 and 7).

Construction responsibilities:

The Commission attaches **Special Condition 1** to further ensure the protection of water quality and adjacent ESHA from construction-related impacts. This condition outlines general construction standards and responsibilities that must be adhered to. These include but are not limited to (a) conducting the authorized work only during the dry season period of June 15 through October 15; (b) delineating the limits of the work areas prior to the commencement of construction to limit the potential area affected by construction and ensure that all wetland areas that are not part of the authorized work areas identified by ESHA fencing are avoided during construction; (c) maintaining all motorized equipment used at the project site in proper working condition and free of drips and leaks; (d) maintaining a spill prevention and clean-up kit available on-site for immediate use in case of an accidental spill and checking and maintaining equipment or vehicles operated adjacent to the Klamath River daily to prevent leaks; (e) prohibiting activities within coastal waters; (f) maintaining adequate stocks of stormwater runoff and erosion control barrier materials onsite and ensuring that appropriate erosion, sedimentation, and runoff control devices are installed around all work areas and staging areas prior to commencement of construction; (g) promptly mulched or covering bare soil areas if rainfall is forecast during the time construction activities are being performed; (h) recovering any debris discharged into coastal waters immediately and disposing of it properly; (i) seeding all disturbed soils prior to the rainy season in compliance with the approved plan required to be implemented per **Special Condition 3**; and (j) ensuring that all on-site workers and contractors understand and agree to observe the standards for work outlined in this permit prior to the commencement of the repair and maintenance activities authorized by this permit.

Changes to final approved plans would require amendment of permit:

The special conditions provide that no changes to the final plans required by **Special Conditions 2, 3, or 6** shall occur without a Commission approved amendment to this coastal development permit, unless the Executive Director determines that no amendment is legally required. **Special Condition 7** further requires that the permittee provide the Executive Director with evidence that all other final state and federal authorizations and approvals have been received prior to commencement of construction, and that any changes to the project that may be required by such authorizations and approvals may require an amendment to CDP 1-11-039.

Therefore, for all of the reasons set forth above, the Commission finds that as conditioned, all feasible mitigation measures have been provided to minimize adverse environmental effects consistent with Sections 30230, 30231, 30232, 30233 and 30240 of the Coastal Act. In addition, The Commission finds that as conditioned to require specified revisions and implementation of the various water quality and ESHA protection BMPs described in the Erosion Control Plan, Revegetation Plan, and Bird and Bat Plan and to require adherence to a number of additional construction standards and responsibilities to protect water quality and adjacent ESHA, the proposed development is consistent with Coastal Act Sections 30230, 30231, 30232, and 30240.

As set forth above, Coastal Act Section 30233 requires that projects proposing to fill wetlands be evaluated to ensure that the least damaging feasible alternative is proposed. Caltrans proposes to remove vegetation and grade up an area measuring up to 84 by 110 feet in area (9, 240 sq. ft. or 0.21 acres) at each hinge repair location, within the floodplain of the Klamath River. Each location has been delineated primarily as wetlands, though only vegetation at Hinge 2 (south end of the bridge) is presently vegetated with high quality native plant habitat.

Three alternatives to the proposed project exist: no project; use of temporary access roads for access to the hinge construction areas; and installation of a bypass bridge for full traffic access during construction. The no project alternative would allow the deterioration of the hinges to continue, which would eventually result in the failure of the bridge. Therefore, the Commission finds that the no project alternative is not a feasible less environmentally damaging alternative. The second alternative, to use temporary access roads, was evaluated by Caltrans and found to require removal of an additional two acres of wetland habitat that would not be disturbed by the proposed alternative (using cranes on the bridge deck to lower equipment and materials to the hinge sites, rather than driving them in via new access roads). Therefore, the Commission finds that the alternative of constructing new roads to gain construction access to the floodplain of the river is not a feasible, less environmentally damaging alternative. The third alternative would install a temporary bridge crossing over the Klamath River for bypass use by through-traffic, with or without the use of cranes or access roads. The bypass bridge would be more convenient for motorists, but to achieve safety standards, would require significant installation of support piles in the river channel. Support piles require pile-driving, and the fill of wetlands. Caltrans determined that pile-driving within the Klamath River would, in addition to other impacts such as to water quality, pose significant and impermissibly high risk of harm to state and federally-endangered salmonids and other species inhabiting the river. Therefore, the Commission finds that the third alternative is not a feasible less environmentally damaging alternative.

For all of the reasons described above, therefore, the proposed project is the alternative that least affects wetlands and best protects sensitive species inhabiting the Klamath River. In addition, as

described above, Caltrans proposes and the special conditions require a range of protective measures to limit adverse project impacts on sensitive coastal resources that might otherwise arise. There are no alternatives or mitigation measures that would further reduce the project's potential adverse impacts. Therefore the Commission finds that the proposed project is the least environmentally damaging feasible alternative as required by Section 30233(a) of the Coastal Act.

E. ARCHAEOLOGICAL RESOURCES

Section 30244 of the Coastal Act states as follows:

> *Where development would adversely impact archeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.*

The project area is located within the ethnographic territory of the Yurok Tribe, and construction will take place within the boundaries of the Yurok Reservation. The proposed project vicinity is considered sensitive for archaeological materials. The proposed project area was surveyed for archaeological resources by a registered professional archaeologist in the spring of 2010, and a Historical Property Survey Report was prepared (Sara Atchley Thomas, M.A. RPA, April 7, 2010). No previously unrecorded cultural resources were identified as a result of the survey. Nevertheless, Caltrans proposes to grade pads near each hinge repair area, and to install temporary foundations that may reach ten feet below existing grade. Caltrans has entered into agreement with the Yurok tribe to provide for monitoring of all earthmoving operations by experts designated by the Yurok tribe. In addition, a Native American Graves Protection Act and Repatriation Plan of Action has been prepared in accordance with federal requirements. Caltrans proposes and **Special Condition 4** provides for implementation of the Plan of Action under the guidance of the tribal authorities if cultural remains are identified. If additional grading or other disturbance of sensitive coastal resources would be required by the actions requested under such circumstances by the designated tribal expert, an amendment to CDP 1-11-039 or a new coastal development permit may be required based on a review of the requested actions by the Executive Director.

For these reasons, to ensure protection of any archaeological or cultural resources that may be discovered at the site during construction of the proposed project, the Commission attaches **Special Condition 4**. This condition requires that if an area of cultural deposits is discovered during the course of the project, all construction must cease and a qualified cultural resource specialist authorized by the Yurok tribe must analyze the significance of the find. To recommence construction following discovery of cultural deposits, the applicant is required to submit a supplementary archaeological plan for the review and approval of the Executive Director to determine whether the changes are *de minimis* in nature and scope, or whether an amendment to this permit is required.

Therefore, the Commission finds that the proposed project, as conditioned, is consistent with Coastal Act Section 30244, as the development will include mitigation measures to ensure that the development will not adversely impact archaeological resources.

F. PUBLIC ACCESS

Section 30210 of the Coastal Act requires that maximum public access shall be provided consistent with public safety needs and the need to protect natural resource areas from overuse. Section 30212 of the Coastal Act requires that access from the nearest public roadway to the shoreline be provided in new development projects except where it is inconsistent with public safety, military security, or protection of fragile coastal resources, or adequate access exists nearby. Section 30211 requires that development not interfere with the right of the public to access gained by use or legislative authorization. Section 30214 of the Coastal Act provides that the public access policies of the Coastal Act shall be implemented in a manner that takes into account the capacity of the site and the fragility of natural resources in the area. In applying Sections 30210, 30211, 30212, and 30214, the Commission is also limited by the need to show that any denial of a permit application based on these sections, or any decision to grant a permit subject to special conditions requiring public access, is necessary to avoid or offset a project's adverse impact on existing or potential access.

The proposed project is located on Highway 101, the key public access corridor on the North Coast. The Highway 101 Klamath River Bridge is the sole crossing of the lower reaches of the Klamath River, and no convenient alternative routes exist to provide reasonable detours around the bridge construction site. Caltrans proposes to implement one-way traffic management throughout the three proposed summer construction seasons to provide adequate space for construction activities repairing one-half of each hinge at a time. One-way traffic control measures could moderately delay traffic, particularly during summer peak weekend travel days, but public access would not be significantly affected by the one-way traffic control. Bicycles and pedestrians would be piloted across the one-way traffic control areas consistent with traffic safety requirements, and would be allowed across the bridge even during full bridge closures, under the direction of on-site personnel supervising site construction or safety requirements. Caltrans confirms that boaters using the active river channel will not be affected by project construction.

Caltrans indicates that in addition to the one-direction traffic control, up to 20 night closures of the entire bridge may be necessary over the entire construction period (which is anticipated to last through three summer construction seasons, as noted). Night closures are deemed necessary by Caltrans to allow for crane(s) to deliver equipment, compactors, generators, and temporary foundation cribbing and temporary steel supports and falsework for the bridge. The closures would last up to seven hours, though Caltrans staff has indicated that these are worst-case estimates and that every effort will be made to reduce the duration of these outages significantly. Caltrans has submitted a plan to broadly communicate the extent of road closures a minimum of two weeks prior to any full bridge closure and to provide bottled drinking water and portable toilets where drivers may be required to wait on the highway for extended periods of time. No alternative routes are available for detours.

Caltrans has verified on request that the outriggers of cranes on the bridge could be quickly pulled in to allow emergency vehicles to pass, and delays for emergency crossings of only a few minutes would result even during full bridge closures. The Commission therefore imposes

Special Condition 7 (B), which requires adequate public communication of the pending closures and the provision of basic public services for any travelers stranded roadside of the bridge during an overnight closure.

The proposed project will not create any new demand for public access or otherwise create any additional burdens on public access.

Therefore, for all of the reasons set forth above, the Commission finds that the proposed project as conditioned will not have any significant, lasting, adverse effects on public access, and the project as proposed without new public access is consistent with the requirements of Coastal Act Sections 30210, 30211, 30212, and 30214.

G. OTHER APPROVALS

The project is located within the state highway right-of-way and is subject to the review and approval of other state and federal agencies, which may include the Yurok Tribal Water Quality Unit, Army Corps of Engineers, NOAA Fisheries, California Department of Fish and Game, State Lands Commission, and the Regional Water Quality Control Board. To ensure that the project ultimately approved by these agencies is the same as the project authorized herein, the Commission attaches **Special Condition 7**, which requires the applicant submit evidence of the pertinent approvals prior to commencement of construction. The condition requires that any changes resulting from the review and authorization of the subject project by other state or federal authorities not be incorporated into the project until the applicant obtains any necessary amendments to this coastal development permit.

H. STATE LANDS

The project site is located in an area subject to the public trust. Therefore, to ensure that the applicant has the necessary authority to undertake all aspects of the project on these public lands, the Commission attaches **Special Condition 5**, which requires that the project be reviewed and where necessary approved by the State Lands Commission prior to the commencement of activities authorized by the coastal development permit.

I. ALLEGED VIOLATION

Caltrans staff conducting a site visit in the proposed project area last fall observed that vegetation had been cleared within the riparian corridor adjacent to the bridge by a Caltrans maintenance crew. The Caltrans staff notified Commission staff of the work, which was performed without the benefit of coastal development permits in an area traversing the Commission's retained and appellate jurisdictions.

On November 10, 2011, at the request of Commission staff, Caltrans submitted a letter that provided additional information (described as additional project description information) about the extent of vegetation cleared during the previous summer (Exhibit 7).

Caltrans conferred with Commission staff about the resolution of the unpermitted vegetation removal, and agreed that the vegetation that would have been removed for the hinge repair project would be included as an after-the-fact component of the pending application for CDP 1-11-039, in addition to the proposed removal of vegetation that has not yet been undertaken.

Caltrans also agreed that a separate coastal development permit application would be submitted for the other vegetation removal that was not required for the hinge repair activities. Caltrans staff indicates that preparation of the pending application is in progress.

Consideration of this application by the Commission has been based solely upon the Chapter 3 policies of the Coastal Act. Review of this permit does not constitute a waiver of any legal action with regard to the cited alleged violation nor does it constitute an admission as to the legality of any development undertaken on the subject site without a coastal permit. **Special Condition 9** ensures that this permit is deemed issued upon Commission approval and that it will not expire, as development has already commenced and been (in part) completed.

J. CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

On May 31, 2011 Caltrans as lead agency certified a Mitigated Negative Declaration (SCH 2010102013) for the subject "*Klamath River Bridge Hinge Replacement Project", United States Route 101 in Del Norte County"* and identified the present project proposal as the preferred alternative.

Section 13906 of the Commission's administrative regulation requires Coastal Commission approval of coastal development permit applications be supported by a finding showing the application, as modified by any conditions of approval, is consistent with any applicable requirements of the California Environmental Quality Act (CEQA). Section 21080.5(d)(2)(A) of CEQA prohibits a proposed development from being approved if there are any feasible alternatives or feasible mitigation measures available, which would substantially lessen any significant adverse effect the proposed development may have on the environment.

The Commission incorporates its findings on Coastal Act consistency at this point as if set forth in full. As discussed above, the proposed project has been conditioned to be consistent with the policies of the Coastal Act. No public comments regarding potential significant adverse environmental effects of the project were received prior to preparation of the staff report. 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 required. As conditioned, there are no other feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse impact that the activity may have on the environment. Therefore, the Commission finds that the proposed project, as conditioned to mitigate the identified impacts, can be found consistent with the requirements of the Coastal Act to conform to CEQA.

APPENDIX A:

SUBSTANTIVE FILE DOCUMENTS

1. "Bird and Bat Exclusion and Protection Plan for the Klamath River Bridge Hinge Replacement Project" dated December 2011, prepared by Caltrans biologist Carol Wilson, B.S., M.S., Wildlife Biology, Humboldt State University, submitted by Caltrans on December 15, 2011 (**Exhibit 5**).

2. "Bat Surveys at the Klamath River Bridge, 2009 – 2011" prepared by Carol Wilson, Caltrans biologist (see above), undated attachment to "Bird and Bat Exclusion and Protection Plan" (above).

3. Additional project description information concerning the effects of vegetation removal at the subject site, prepared by Caltrans biologist Clare Golec, B.A., Botany, Humboldt State University at the request of Commission staff, dated November 10, 2011 and submitted by cover letter of Dana York, Senior Environmental Planner, Caltrans on November 10, 2011.

4. "Klamath River Bridge Hinge Replacement Project Revegetation, Mitigation and Monitoring Plan" dated November 2011, prepared by Caltrans biologist Clare Golec (see above), submitted by Caltrans on November 29, 2011 (**Exhibit 4**).

5. Letter dated December 14, 2011 from Mark Suchanek, Deputy Director, Caltrans District 1, to Coastal Commission staff, received on December 19, 2011, revising project description to include 0.790 acres of additional coastal wetland restoration and enhancement (mitigation) within the bridge corridor, including map of additional area, and proposing limitations on future maintenance activities within the bridge corridor (**Exhibit 7**).

6. "Klamath River Bridge Hinge Replacement Project, Initial Study with Negative Declaration" dated May 2011, prepared by Caltrans, under the direction of Steve Croteau, Associate Environmental Planner, submitted by Caltrans October 6, 2011.

7. "Natural Environmental Study (NES) Addendum, Klamath River Bridge Hinge Replacement Project," dated April 15, 2011, prepared by Carol Wilson, Caltrans biologist (see above), submitted by Caltrans October 6, 2011.

8. "Natural Environmental Study (NES) Klamath River Bridge Hinge Replacement Project, " dated September 2010, prepared by Carol Wilson, Caltrans biologist (see above), submitted by Caltrans October 6, 2011.

9. "Delineation of Coastal Zone Wetlands for the Klamath Bridge Hinge Project," dated April 2011, prepared by Carol Wilson, Caltrans biologist (see above), submitted October 6, 2011.

10. "Preliminary Jurisdictional Determination for the Klamath Bridge Hinge Project," dated May 2011, prepared by Carol Wilson, Caltrans biologist (see above), submitted October 6, 2011.

11. "Klamath Bridge Hinge Repair Underwater Noise Analysis" dated March 28, 2011 prepared by David Buehler, P.E., consulting engineer/acoustician retained by Caltrans, submitted as a Memorandum to Steve Croteau, Caltrans (see above), submitted by Caltrans October 6, 2011.

12. Clarification memorandum regarding "Klamath Bridge Hinge Repair Underwater Noise Analysis" dated January 12, 2012 pursuant to request of Commission staff, prepared by David Buehler, P.E., consulting engineer/acoustician.

13. "Historic Property Survey Report" dated April 7, 2010 prepared by Sara Atchley Thomas, M.A., Registered Professional Archaeologist (RPA), submitted by Caltrans October 6, 2011.

14. "Plan of Action for the Treatment of Native American Cultural Items During Construction of the Klamath River Bridge Hinge Replacement Project," prepared November 2010 pursuant to the Native American Graves Protection and Repatriation Act, and signed by Charlie Fielder, Caltrans District 1 Director and by Thomas O' Rourke (signed for), Chair, Yurok Tribal Council, both dated November 15, 2010, submitted by Caltrans October 6, 2011.

15. Letter dated December 12, 2011 prepared by Kevin Church, Caltrans project manager, adding the Yurok Tribe/Caltrans National American Graves Protection and Repatriation Act Plan of Action (NAGPRA POA) to the Klamath River Bridge hinge replacement project description.

16. Caltrans internal Memorandum dated September 20, 2011 by Todd Lark, Caltrans Project Engineer, regarding Klamath River Bridge Hinge Replacement Project, Bridge Hinge Demolition/Reconstruction Plan (constitutes a portion of the project description), submitted by Caltrans October 6, 2011.

17. Letters from Kevin Church, Caltrans project manager, regarding effect of repairs on anticipated lifespan of the Klamath Bridge, bird and bat nesting/roosting habitat on the repaired bridge, and information concerning cultural resource evaluation for the project location, dated December 12, December 14, and December 14, 2011, respectively, and received by Commission staff on December 15, 2011.

18. Caltrans internal Memorandum dated September 20, 2011 prepared by Todd Lark, project engineer, containing "Erosion Control, Grading, Drainage and Water Pollution Control Plan," received by Commission staff on October 6, 2011. (**Exhibit 6**)

19. Revised project description and various clarifications submitted by Caltrans, January 23 and 24, 2012. (including Hinge 2 vegetation removal clarifications – **Exhibit 8**)

20. Memorandum from David Buehler, P.E., to Steve Croteau (Caltrans), dated February 1, 2012, received February 6, 2012 by Commission staff, providing a 4-page addendum to previous hydroacoustic analysis, and titled: "Klamath Bridge Hinge Repair Underwater Noise Analysis- hoe ram energy revision and concurrent demolition operations."

21. Memorandum from Fisheries Hydroacoustic Working Group, to Applicable Agency Staff, dated July 12, 2008, regarding Agreement in Principle for Interim Criteria for Injury to Fish from Pile-Driving Activities.

22. CDP 1-06-022 (Ten Mile River Bridge, Caltrans)

23. CDP 1-07-013 (Mad River Bridges, Caltrans)