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STAFF REPORT: MATERIAL AMENDMENT

Amendment Application No.: 1-07-013-A3

Applicant: California Department of Transportation

Project Location: U.S. Route 101, Mad River Bridges, between Arcata and McKinleyville, unincorporated area of Humboldt County.

Description of CDP 1-07-013: Construct two new cast-in-place (CIP) concrete box girder bridges, reconfigure new on and off ramps and central/route 200 intersection, and demolish the existing bridges.

Amendment Request: (1) Approve a final long term compensatory fisheries mitigation plan to satisfy the requirements of Special Condition No. 5D; (2) modify the riparian wetland mitigation requirements of Special Condition No. 15C to allow use of the Caltrans Elk River Mitigation Bank as an off-site wetland mitigation location and reduce the compensatory riparian wetland mitigation replacement ratio from 4:1 to 3.4:1

Staff Recommendation: Approval with Special Conditions.

SUMMARY OF STAFF RECOMMENDATION

The California Department of Transportation (Caltrans) proposes to amend CDP 1-07-013, granted by the Commission in 2008, for the replacement of the north and southbound Highway 101 bridges over the Mad River. The Commission's original approval authorized fill impacts that were permissible consistent with the allowable use limitations of Section 30233(a)(4) because

the proposed fill was for an incidental public service purpose. The original development project as authorized was anticipated to permanently impact approximately 1.5 acres of wetlands/riparian habitat, temporarily impact approximately 8 acres of stream channel habitat, and take threatened salmonid species. This amendment seeks: (1) approval of a final long-term compensatory fisheries mitigation plan required by Special Condition No. 5D to be submitted for review by the Commission as a permit amendment; (2) modification to the location of required off-site wetland mitigation required by Special Condition No. 15A; and (3) adjustment of the wetlands mitigation ratio required by Special Condition No. 15C.

The fisheries mitigation plan provides for implementation of four projects designed to remove barriers to fish passage on the Mad River and several of its tributaries to increase spawning habitat of fish species affected by the Mad River Bridges Replacement project. As required, the submitted fisheries mitigation plan provides information regarding final mitigation calculations, estimates of fish losses, and compensation calculations for fisheries losses as required by the Special Condition No. 15C. The submitted plan demonstrates that the mitigation will adequately mitigate for the loss of 246 salmonids from project impacts. Fisheries losses will be fully mitigated in approximately two years by producing at least 165 salmon smolts per year, and provide long term benefits for fish populations for the life of the habitat restoration projects by restoring approximately 6.5 acres of stream channel and access to upstream spawning habitat in the lower Mad River basin.

The modifications to Special Condition No. 15D would allow use of mitigation credits at the existing Caltrans Elk River Mitigation Bank as part of the required riparian wetland mitigation required for the project. Staff recommends approval of the proposed special condition modifications to allow the mitigation bank credits to be used because implementing wetland mitigation at an established mitigation bank where the wetlands have already been restored ensures that the required mitigation will be successful and will be provided in a shorter amount of time. Staff also recommends modifying the originally required wetland mitigation ratio of 4:1 to 3.4:1 in recognition of the fact that the use of mitigation credits from the already constructed Elk River Mitigation Bank with its fully restored wetlands reduces the temporal loss associated with the wetland fill impacts of the project, and thereby reduces the need for the higher existing ratio.

The motion to conditionally approve the modified development is found on page 4.

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I. MOTION AND RESOLUTION

Motion:

I move that the Commission approve the proposed amendment to Coastal Development Permit 1-07-013-A3 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 original permit (CDP No. 1-07-013) contains twenty-one special conditions. **Special Condition Nos. 5 and 15** are modified and reimposed as conditions of CDP Amendment No. 1-07-013-A3. All the other special conditions will remain in effect. There are no additional special conditions attached to CDP Amendment No. 1-07-013-A3. The modified conditions are listed below. Deleted language is shown in ~~**bold double-strikethrough**~~ type; new text appears in **bold double-underlined font**. For comparison, the text of the original permit conditions is included in Exhibit No.10.

5. MAD RIVER FISH AND OTHER AFFECTED SPECIES MONITORING & MITIGATION PLAN.

- A. **PRIOR TO ISSUANCE OF CDP 1-07-013**, Caltrans shall submit a **Preliminary Monitoring & Mitigation Plan for Fish and Other Affected Species** subject to the review and approval of the Executive Director. Such plan shall be submitted by Caltrans after their consultation with biologists of the California Department of Fish & Game, the National Marine Fisheries Service, and other pertinent advisors with expertise regarding the biota of the Mad River or other technical issues associated with the requirements of the Plan. The Plan shall be prepared by qualified biologists with educational background and field experience substantially relevant to the species of concern. The plan shall include at a minimum the following elements:

- (1) Preliminary Information.** All materials related to the potential impacts of the proposed project that have been provided by Caltrans to the California Department of Fish and Game, National Marine Fisheries Service, Regional Water Quality Control Board, Army Corps of Engineers, Environmental Protection Agency, and State Lands Commission since January 1, 2005 in support of the subject project and copies of all final permits, approvals, leases, or other authorizations of or from these agencies shall be attached to the Preliminary Plan as Exhibits.
- (2) Baseline Surveys.** Surveys to acquire comprehensive baseline information about the habitats and all species present in areas of the Mad River corridor that may be affected by the proposed project, or by the mitigation measures implemented in accordance with the provisions of CDP 1-07-013 shall include but not be limited to the following elements:

 - (a) A survey design developed in cooperation with biologists of the California Department of Fish and Game and the National Marine Fisheries Service and approved by the Executive Director.
 - (b) Provisions for conducting preliminary surveys during 2008 prior to any disturbance of the Mad River corridor (including the associated riparian vegetation) and refining and repeating these surveys prior to commencement of pile-driving activities in the 2009 and 2011 pile-driving years and other pile-driving years that may arise during project construction that may affect the species that inhabit the Mad River.
 - (c) Provisions and detailed methods for documenting the types and distribution of physical habitats within the reach of the river from at least 500 meters upstream to 500 meters downstream from the proposed pile-driving locations.
 - (d) Provisions and detailed methods for documenting, to the extent feasible, the presence, distribution, and relative abundance of all aquatic species within the reach of the river from at least 500 meters upstream to 500 meters downstream from the proposed pile-driving locations.
 - (e) Provisions and detailed methods for estimating within the reach of the river from at least 500 meters upstream to 500 meters downstream from the proposed pile-driving locations the density and size frequency or age-class frequency of fish by species, habitat type, and location, and the total abundance of fish by species; this provision need not include small species that typically inhabit cryptic habitats.
 - (f) Provisions for adequate replication and an analysis of the precision of the estimates.
- (3) Implementation of a Fish Exclusion Zone (FEZ).** Provide a complete description and analysis of all components of the Fish Exclusion Project proposed by Caltrans, including but not limited to the following elements:

(a) A description of the methods of establishing, maintaining, operating, and restoring upon any failure that may occur, the Fish Exclusion Zone and the proposed linear fish migration corridor within the FEZ limits, and a description of all associated development in the Mad River Channel, including “enhancement structures” outside of the FEZ, “temporary augmentation structures” and all other artificial features conceptually proposed by Caltrans in November – December 2007 for placement within the Mad River but deferred by Caltrans for later provision of a detailed project description after Commission approval of CDP 1-07-013.

(b) Provisions and detailed methods for removing fish and other organisms from the FEZ.

(c) Provisions for estimating the number of fish present within the FEZ by species and age- or size class using the methods developed in section A(2) above. Estimates will be made both before and after the initial fish removal (depopulation) from the FEZ following construction of the fish exclusion barriers and before commencement of pile driving. The number of fish removed will be counted by species and age- or size—class. This information shall be recorded and retained in the project records and pertinent monitoring reports and plans.

(d) Provisions for counting the number of fish by species and age- or size—classes that are removed from the FEZ following repair of the barrier should the barrier fail. The relationships developed in section A(3)(c) above will be used in conjunction with the number of fish removed to estimate the number of fish remaining in the FEZ following the repair of the barrier. This information shall be recorded and retained in the project records and pertinent monitoring reports and plans.

(e) Provisions for adjusting the size and location of the FEZ based on empirical results of the hydroacoustic monitoring and the caged fish study.

(4) Estimation of Losses Due to Project Implementation and Mitigation Requirements.

Provide a description of the methods that will be used to calculate resource losses and compensatory mitigation requirements, including but not limited to the following elements:

(a) Provisions for numerical estimates of losses of fish and compensatory mitigation requirements in terms of adult equivalent fish that would have migrated to spawning areas of the Mad River or tributaries.

(b) Estimation of the area and periods of loss of habitat that is filled, coffered, or otherwise physically degraded due to project activities.

(c) Estimation of direct and indirect impacts to fish from pile driving, from capture and transplantation, and from exclusion from the Fish Exclusion Zone.

- (d) Estimation of impacts to species other than fish from project-related activities.

(5) Monitoring the Impacts of Pile Driving on Caged Fish During Project Construction

The Preliminary Plan shall include provisions for determining whether pile driving during project construction results in the mortality or physical injury of caged fish held at various distances from the piling driving location. The Preliminary Plan for monitoring the effects of pile driving on caged fish must be designed to refine preliminary impact assessments developed pursuant to (1) and (2) above with empirical data. The Preliminary Plan shall discuss conceptually and the Final Plan shall include in detail the following elements:

- (a) An experimental design developed in cooperation with biologists of the California Department of Fish and Game and the National Marine Fisheries Service and pertinent experts in academia, and approved by the Executive Director.
- (b) Explicit specification of the statistical design that will be used to analyze the results, a statistical power analysis, and a trial analysis using mock data; the statistical design must be determined in coordination with the development of the physical design that is feasible in the field and will require preliminary, small-scale experiments; replication may be based on individuals, cages, and repeated experiments.
- (c) Provisions for developing protocols and conducting preliminary experiments during the years prior to pile-driving and the first year of pile driving and conducting the definitive monitoring of impacts on caged fish during the second year of pile driving.
- (d) Provisions for peer review of the experimental design prior to development of a final plan.
- (e) The use of locally available hatchery fish.
- (f) The cooperative involvement of experts from California Department of Fish and Game, National Marine Fisheries Service, Humboldt State University, and the University of California, where such experts are available and interested; appropriately supervised HSU graduate students or University of California graduate students should be used for field and laboratory work when feasible and appropriate.
- (g) The inclusion of appropriate controls for handling, transport, caging, and holding fish in the river.
- (h) Continuous hydroacoustic monitoring of sound levels immediately adjacent to caged fish during each experimental period so that effects of distance from pile driving can be expressed in terms of received sound pressure levels.

(i) Specification of protocols for handling test animals subsequent to experimental exposure to pile driving, preparation of animals for pathological analysis, and actual pathological analysis.

(j) If the principal investigators selected to undertake the caged fish studies demonstrate, based on preliminary field trials/investigations that the study as contemplated is not feasible due to the physical or chemical conditions of the river or constraints arising from the need to handle and transport fish, the Executive Director may authorize termination of further efforts to undertake the caged fish study otherwise required herein.

B. Prior to Commencement of Construction (other than the test pile work proposed for 2008 at Pier 2, on the pasturelands south of the Mad River) Caltrans shall submit a Final Monitoring Plan for the review and approval of the Executive Director that incorporates (1) the results of the baseline surveys, (2) revisions to the Fish Exclusion Zone proposal incorporating the results of the baseline surveys and other pertinent new information, (3) revisions of the estimation of losses of fish from project implementation and mitigation requirements based on the results of the baseline surveys and other pertinent new information, (4) revisions to the caged fish study that incorporate the results of the peer review of the caged fish study required by subsection (5)(d) above, (5) provisions for how caged fish study data will be used for adaptive management purposes, and Caltrans shall submit the Final Monitoring Plan for the Executive Director's review no later than January 1, 2009 and shall not commence any activities that would affect the subject areas of the Mad River and environs until Caltrans receives evidence of the Executive Director's review and approval of the Final Monitoring Plan.

C. No later than March 1 of the year following the first pile-driving season, a Final Revised Monitoring Plan that addresses the effects of pile driving on caged fish shall be submitted for the Executive Director's review and approval, that incorporates the results of the peer review of the first pile-driving season. Caltrans shall not commence any additional pile-driving activities until Caltrans receives evidence of the Executive Director's review and approval of the Final Revised Monitoring Plan.

D. Final Fisheries and Other Affected Species Compensatory Mitigation Plan:

Not later than October 1 of the year of the second pile-driving season (presently projected as October 1, 2011), Caltrans shall submit a complete analysis of the effects of the subject project on the sensitive species and habitat of the Mad River based on the data collected during project operations in accordance with Conditions 4 and 5, and shall submit a Final (complete) application for an amendment to CDP 1-07-013 for Long term compensatory Mitigation of fisheries impacts associated with all aspects of the subject project, including pile-driving, that have adversely affected the fisheries of the Mad River. The long term compensatory mitigation plan shall mitigate, to the maximum extent feasible, all significant direct and indirect impacts to fish from pile driving, capture and transplantation, and from exclusion from the Fish Exclusion Zone, as well as significant impacts to species other than fish from project-related activities.

E. Implementation of Final Fisheries and Other Affected Species Compensatory Mitigation Plan:

- 1. Caltrans shall implement the final fisheries and other affected species compensatory mitigation plan submitted pursuant to Section D above, titled, "Long Term Compensatory Fisheries Mitigation Plan, Mad River Bridges, November 27, 2012." The permittee shall ensure that the fish passage restoration projects planned on the Mad River at the Blue Lake Fish Hatchery weir, Hall Creek, Mill Creek, and Lindsay Creek are carried out as approved. Any changes to the approved final plan shall be reported to the Executive Director. No changes to the approved final plans shall occur without a Commission amendment to this coastal development permit, unless the Executive Director determines that no amendment is legally required.**
- 2. The permittee shall perform low-flow surveys of each fish passage restoration site after the first winter after construction to document the as-built condition of the site and evaluate the success of the fish passage restoration project in achieving the goals of the approved compensatory mitigation plan. The permittee shall submit for the review and approval of the Executive Director a final monitoring report by December 31st of the year in which the low flow survey is conducted that evaluates whether the fish passage restoration project conforms to the goals, objectives, and performance standards set forth in the approved compensatory fisheries mitigation plan. The report must include the low flow survey of the restoration site and photographs of the restoration site at the time of the survey. If the final report indicates that the mitigation project has been unsuccessful, in part, or in whole, based on the approved performance standards, the permittee shall submit a revised or supplemental mitigation program to compensate for those portions of the original program which did not meet the approved performance standards. The revised mitigation program shall be processed as an amendment to this coastal development permit, unless the Executive Director determines that no amendment is legally required.**

15. Revised Wetland/Stream Channel Mitigation Plan.

PRIOR TO ISSUANCE OF CDP 1-07-013, Caltrans shall submit a revised plan for the review and approval of the Executive Director for wetland mitigation including wetland riparian loss and stream channel impacts from project activities other than pile-driving and the associated fish exclusion activities and that includes, but is not limited to, the following requirements:

- A. On-site mitigation credited in previous mitigation plans submitted by Caltrans for wetland mitigation in areas that will be beneath the proposed new bridges shall be limited (or verified as limited) only to the equivalent wetland area that was delineated beneath the existing bridges slated for demolition. Other revegetation installed beneath the additional area of the proposed new bridges shall not count toward on-site mitigation, but must instead be added to the overall area of wetland mitigation that must be undertaken

off-site.

- B. Off-site riparian wetland mitigation at the proposed Old Samoa Road 40-acre parcel acquired by Caltrans in 2007 providing a maximum of two (2) acres of compensatory riparian wetland mitigation necessary for the Mad River Bridges project.
- C. The plan shall provide that all wetland impacts associated with the proposed project construction, including any impacts to riparian corridor wetland soils or vegetation that last longer than twelve months, shall be mitigated at a minimum total ratio of ~~4:1~~, 3.4:1 with 1:1 mitigation of riparian wetland impacts on site to the maximum extent feasible where suitable locations on the subject site exist, and the balance of the required mitigation shall require compensatory off-site mitigation within the watershed of the Mad River and at the Caltrans Elk River Mitigation Bank along Elk River Slough near Humboldt Bay to the extent wetland credits remain at the mitigation bank. (~~4:1~~ 3.4:1 ratio means that ~~4~~ 3.4 acres of similar wetland mitigation per acre of wetland impact at the project site). The plan shall further provide for the off-site mitigation of stream channel bottom impacts to channel habitat location in the area between bottom-of-bank to bottom-of-bank, and at a minimum ratio of 1:1 (1 acre of stream channel mitigation per acre of stream channel impact). The channel impacts shall be calculated annually for the authorized project activities undertaken in this area of the subject site between May 1 and October 14 annually, and added cumulatively for the final total of such area that requires 1:1 mitigation. To the extent feasible, the mitigation provided in the plan shall be performed in the location of fisheries mitigation, such as, but not limited to, the stream channel locations of fish passage improvements that may be proposed pursuant to Special Condition 5, so that the maximum ecological benefits may be obtained where feasible.
- D. Final Plan. **Not later than October 1 of the second pile-driving year** (presently estimated as October 1, 2011 by Caltrans) Caltrans shall submit a final Wetland and Stream Channel Mitigation Plan for the review and approval of the Executive Director, in consultation with the California Department of Fish & ~~Game~~ Wildlife (CDFW) and the National Marine Fisheries Service that incorporates all of the requirements of subsections A, B, and C above and any additional mitigation for impacts to wetlands or stream channel that become necessary as the impacts of actual construction become known during implementation of the project.
- E. Within 90 days of the approval of the final Wetland and Stream Channel Mitigation Plan by the Executive Director, Caltrans shall inform CDFW in writing of the extent of any wetland credit taken from the Elk River Mitigation Bank for use in the approved final Wetland and Stream Channel Mitigation Plan, and (2) shall submit to the Executive Director an accounting from CDFW of the balance of wetland mitigation credits at the Elk River Mitigation Bank after use of credits for the approved final Wetland and Stream Channel Mitigation Plan.**

III. FINDINGS AND DECLARATIONS

A. AMENDMENT DESCRIPTION

Project Background

On January 8, 2008, the Commission approved, with twenty special conditions, Coastal Development Permit (CDP) 1-07-013, authorizing development for the Mad River Bridges Replacement Project. See the staff report for CDP 1-07-013 for more information about the original project (Exhibit 5). The development project entailed the construction of two concrete span bridges to replace the aging, structurally-and seismically deficient bridges of U.S. 101's crossing of the Mad River, approximately one mile north of the City of Arcata in unincorporated Humboldt County. As authorized under the original CDP, construction of the replacement bridges was completed over a four-year period, with the in-water construction activities limited to specific seasonal periods to minimize 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*), Southern Oregon/Northern California Coast coho salmon (*Oncorhynchus kisutch*), Northern California Coast Steelhead (*Oncorhynchus mykiss*), and Coastal cutthroat trout (*Oncorhynchus clarki clarki*). Construction on the replacement bridges commenced in the spring of 2009 and continued until project completion in fall/winter 2012.

Since the approval of CDP 1-07-013 in 2008, the Commission has authorized two amendments to the permit. On August 8, 2008, the Commission granted CDP 1-07-013-A1, an immaterial amendment authorizing the relocation of an existing buried eight-inch-diameter natural gas pipeline on the northern and southern ends of the Mad River Bridge to accommodate reconstruction of the bridge.

On August 10, 2012, the Commission granted CDP 1-07-013-A2, a material amendment, to allow for retention of portions of three sets of old bridge piers (Piers 6, 8, and 9) previously proposed and required under the original permit to be demolished as part of the Mad River Bridges Replacement Project. The retention of remnants of old Pier 8 was also approved to conserve and enhance a scour pool in the river bottom that provides significant fish habitat. The conservation and enhancement of the scour pool substituted for the originally authorized creation of an entirely new scour pool approximately 100 feet downstream.

Proposed Amendment

This amendment requests the following: (1) approval of a final long term compensatory fisheries mitigation plan to satisfy the requirements of [Special Condition No. 5D](#); and (2) modification of the riparian wetland mitigation requirements of Special Condition No. 15C to allow use of the Caltrans Elk River Mitigation Bank as an off-site wetland mitigation location and reduction of the compensatory riparian wetland mitigation replacement ratio from 4:1 to 3.4:1.

As required by [Special Condition No. 5D](#), Caltrans is submitting a CDP application for an amendment to CDP 1-07-013 seeking approval of a final long term compensatory fisheries mitigation plan for adverse impacts to fisheries associated with all aspects of the subject project, including pile-driving. The submitted plan provides a complete analysis of the effects of the

subject project on sensitive species and in stream channel habitat of the Mad River based on the data collected during project operations. As detailed in Finding D below, to mitigate for these impacts, the plan includes implementation of four separate mitigation projects involving the removal of barriers to fish passage on the Mad River or its tributaries to increase fish spawning habitat. The plan provides information on howall significant direct and indirect impacts to fish from pile driving, capture and transplantation, and from exclusion from the Fish Exclusion Zone, as well as significant impacts to species other than fish from project-related activities will be mitigated.

Special Condition No. 15C currently requires that all riparian wetland impacts be mitigated on site to the maximum extent feasible, and that any off-site mitigation be provided within the watershed of the Mad River. The applicant proposes to modify this requirement regarding the location of off-site mitigation to allow use of the Caltrans Elk River Mitigation Bank along the lower reaches of Elk River Slough, within the Humboldt Bay watershed instead of the Mad River watershed. The Applicant proposes to debit the 1.53-acre balance of mitigation credit left in the bank. The Applicant also proposes to modify the mitigation ratio requirements of **Special Condition No. 15C**, reducing the required mitigation ratio from 4:1 to 3.4:1. The Applicant believes the reduction in the required mitigation ratio is appropriate, as the portion of the Mad River Bridge wetland impacts to be mitigated at the Elk River Mitigation Bank does not involve a temporal loss between the time of impact and the time when habitat values have been restored. The wetland restoration development at the Elk River Mitigation Bank was completed over 20 years ago and the restored wetlands have been fully functional since long before the riparian wetland impacts of the Mad River Bridges replacement project occurred. The amount the mitigation ratio would be reduced corresponds with the amount of temporal loss that no longer needs to be accounted for by mitigating using the already functioning wetlands at the mitigation bank.

B. OTHER AGENCY APPROVALS

The original development required approval from several local, state and federal government agencies. Pursuant to the **Special Condition No. 3**, prior to construction, Caltrans was required to 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 had been received by Caltrans. Caltrans successfully obtained approval from all the necessary permitting authorities, and those permits include authorization for the mitigation measures proposed in this amendment. There are no additional agency approvals required for this amendment.

C. STANDARD OF REVIEW

The project area is bisected by the boundary between the retained coastal development permit jurisdiction of the Commission and the coastal development permit jurisdiction delegated to Humboldt County by the Commission through the County's certified Local Coastal Program.

The Coastal Act was amended by Senate Bill 1843 in 2006, effective January 1, 2007, adding Section 30601.3 to the Coastal Act. Section 30601.3 authorizes the Commission to process a consolidated coastal development permit application when requested by the local government

and the applicant and approved by the Executive Director, for projects that would otherwise require coastal development permits from both the Commission and a local government with a certified LCP. In this case, the Humboldt County Board of Supervisors adopted a resolution and Caltrans submitted a letter requesting consolidated processing of the coastal development permit application by the Commission for the subject project, which was approved by the Executive Director.

The policies of Chapter 3 of the Coastal Act provide the legal standard of review for a consolidated coastal development permit application submitted pursuant to Section 30601.3. The local government's certified LCP may be used as guidance.

D. PERMISSIBLE DIKING, DREDGING, FILLING /PROTECTION OF WATER QUALITY.

See Finding 4.2 of the Adopted Findings for CDP 1-07-013(Exhibit 10) for information on the environmental setting and project area location, as well as a detailed account of habitat types and special status species that are found in and around the original project area.

The proposed amendment involves approval of a long term compensatory fisheries mitigation plan required by [Special Condition No. 5D](#) to be submitted for the review and approval of the Commission in the form of a permit amendment and modifications to the wetland mitigation requirements of [Special Condition No. 15](#) to allow a portion of the off-site mitigation to occur outside of the Mad River watershed at the Caltrans Elk River Mitigation Bank and to reduce the mitigation ratio from 4:1 to 3.4:1. The fisheries mitigation plan and wetland impact mitigation are required to mitigate for impacts to coastal fisheries and wetlands from construction activities related to the Mad River Bridges Replacement Project. Coastal Act Section 30233 requires, in part, that feasible mitigation measures to minimize adverse environmental effects must be provided for permissible diking, filling, or dredging projects.

Section 30233 of the Coastal Act states, in applicable part:

Diking, filling or dredging; continued movement of sediment and nutrients

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

(1) New or expanded port, energy, and coastal-dependent industrial facilities, including commercial fishing facilities.

(2) Maintaining existing, or restoring previously dredged, depths in existing navigational channels, turning basins, vessel berthing and mooring areas, and boat launching ramps.

(3) In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities and the placement of structural pilings for public recreational piers that provide public access and recreational opportunities.

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

(5) Mineral extraction, including sand for restoring beaches, except in environmentally sensitive areas.

Construction of the Mad River Bridges Replacement Project involved the placement of permanent wetland fill within the Mad River corridor for the foundations for the new bridge. In addition, a significant amount of non-permanent fill was placed in wetlands within the river corridor during the various phases of construction for construction access roads and work platforms, cofferdams, falsework, and related facilities. This wetland fill affected riparian and channel bottom habitat within the river corridor, as well threatened fish species and other wildlife that inhabit the corridor. In approving the original project in 2008, the Commission found that the fill associated with the project was for an incidental public service purpose, an allowable use for diking, filling, and dredging under Section 30233(a)(4) of the Coastal Act. The Commission has in the past determined that the fill for certain highway safety improvement projects that did not increase vehicular capacity was considered to be for an "incidental public service." In reaching such conclusion, the Commission has typically determined that a bridge replacement is a public safety project – and thus is undertaken for a public purpose -- and further, that the project is incidental to "something else as primary." That is, the project is a public safety project incidental to the primary transportation service provided overall by the existing highway. This finding is supported in part on the basis that the subject bridge project is not part of new route or highway expansion.

a. Long Term Compensatory Fisheries Plan

As required by [Special Condition No. 5D](#) of the original permit, Caltrans is submitting for review and approval of the Commission as a coastal development permit amendment a final long term compensatory fisheries mitigation plan. The plan is required to mitigate for impacts associated with all aspects of the subject project that have adversely affected the fisheries of the Mad River, including pile-driving. [Special Condition No. 5D](#) requires that the fisheries mitigation plan provide a complete analysis of the effects of the project on the sensitive species and in stream habitat of the Mad River based on the data collected during project operations. The plan must evidence mitigation measures that will be implemented to mitigate all significant direct and indirect impacts to fish from pile driving, capture and transplantation, and from exclusion from the Fish Exclusion Zone, as well as significant impacts to species other than fish from project-related activities.

Prior to Commission approval of the original permit, Caltrans had submitted a memorandum to the Commission describing potential fish passage mitigation projects within the Mad River watershed that was being developed in coordination with Humboldt County and the California Department of Fish and Wildlife (see Exhibit 4). All of the potential mitigation projects involved improving fish passage along tributaries of the Mad River to re-open blocked stretches of the tributaries and thereby expand potential fish spawning habitat. Caltrans indicated that the project described represented a range of mitigation opportunities within the Mad River watershed, but not all of the sites had been completely evaluated and the amount of potential spawning habitat

that could be generated by each project had not been completely quantified. However, Caltrans committed to further evaluating and using some combination of the Mad River tributary fish passage improvement projects as mitigation for the impacts to Mad River fisheries of the Mad River Bridges replacement project. As final plans for implementing use of these sites for mitigation had not been developed at the time of Commission approval of the original project, **Special Condition No. 5D** requires that the final long term compensatory fisheries mitigation plan be submitted for the review and approval of the Commission as a permit amendment request.

As required by [Special Condition No. 5](#), the fisheries plan provides the following: (1) estimates of the losses due to project implementation and mitigation requirements; (2) complete description and analysis of all components of the Fish Exclusion Project; (3) monitoring results from caged fish study; and (4) a complete analysis of the effects of the project on the sensitive species and habitat of the Mad River based on the data collected during project operations in accordance with **Special Condition Nos. 4 and 5** of the original permit.

The number of fish lost (injured or killed) during each construction year was estimated from observations performed by Caltrans during snorkel surveys, biological monitoring, projected losses from pile driving, and hydroacoustic monitoring. Mortality and injuries to fish were primarily caused by installation of the fish exclusion zone, extension of the gravel bar on the north and south sides of the project, falsework installation, fish removal and relocation activities, and exposure to underwater noise from pile driving. A total of 246 salmonids were assumed or observed to be lost during construction from 2009 to 2011. Fisheries losses were based on juveniles, as that was the life stage that was affected at the time that in stream construction work was occurring. Adult salmonids do not inhabit freshwater during the time of the year (summer) when in stream construction activities took place. Construction activities within the channel in 2009 included installation and removal of a gravel bar extension along the south bank of the Mad River and installation of permanent piles at piers 2,3, and 4. See the tables below for fish injury and mortality data as reported by Caltrans. Construction activities conducted within the channel in 2010 included installation and removal of a gravel bar extension along the south bank of the Mad River and installation of falsework piles along the north bank. There were no fish injured or killed during any of the construction activities in 2010. Construction activities conducted within the channel in 2011 included installation and removal of temporary in-river diversions along the south bank work platform and north bank falsework pad and installation of permanent piles at piers 3 and 4. See the tables below for injury and mortality data as reported by Caltrans. Construction activities conducted within the channel in 2012 included installation and removal of temporary in river diversions along the south bank work platform and north bank falsework pad during bridge demolition and installation of the habitat structure at pier 8. There were no fish injuries or mortalities reported in 2012. See pages 3-8 of Fisheries Mitigation Plan (Exhibit 3) for more information on construction activities that were implemented each year that had the potential to cause injury or mortality to individual fish.

Number of juvenile salmonids injured or killed during 2009

Cause of mortality	Coho (n)	Steelhead (n)	Chinook (n)	Unknown salmonid	Total (N)
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Remained in FEX during pile driving	46	35	6	--	87
FEZ structures	--	13	28	24	68
Fish Removal Activities (e.g. seining, electrofishing)	1				1
Total Lost in 2009					156

Number of juvenile salmonids injured or killed during 2011

Cause of mortality	Coho (n)	Steelhead (n)	Chinook (n)	Unknown salmonid	Total (N)
Remained in FEX during pile driving	--	--	--	87	87
FEZ structures				3	3
Total Lost in 2011					90

During the four in-channel construction seasons the presumed burial of lamprey ammocetes during the installation of the gravel bar is the only known direct impact to aquatic species other than salmonids. However, it is not known how many juvenile lampreys could have been injured or killed. Lamprey occupy many of the same rivers and tributaries as salmonids on the west coast. As a result, it is believed that any projects undertaken to improve habitat quantity or quality for salmonids will benefit lamprey and potentially offset any adverse impacts to that species during construction. Therefore, no additional mitigation is currently proposed.

To mitigate for fisheries losses that occurred during project construction, the amount of fish production that would be gained by implementing fish habitat restoration projects was calculated to determine if increases in productivity through improved habitat would be sufficient to offset project losses. The premise for this calculation is that an individual fish within the Mad River population contributes to overall fish production by finding suitable spawning habitat within the watershed, allowing for the successful incubation and emergence of offspring. Improving spawning areas through in stream habitat restoration increases the likelihood of successful spawning and may increase salmonid populations. This increase in individuals can supplant those that were harmed during the development project, and therefore, mitigate for injury or mortality of individuals by replacing them with new unharmed individuals.

To achieve this increase in production and required mitigation, Caltrans completed four fish passage enhancement projects on the Mad River: main stem Mad River (Blue Lake weir removal), and Mill (culvert), Hall (fishway), and Lindsay Creeks (passage improvement) to mitigate for the loss of juvenile salmonids during construction. Caltrans indicates that the Department funded each of these projects, and implemented all of them except the Mad River Fish Hatchery weir removal project which was implemented by the Humboldt County Resource Conservation District. The District indicates that it used proceeds from a grant from the California Department of Fish and Wildlife (CDFW) to cover project costs prior to executing a contract with Caltrans for funding of the project (see Exhibit 8). The District indicates that the grant funds used by the District were expended on staff time and overhead costs, securing project permits, completing a pre-project longitudinal profile, and finalizing construction plans and specifications for bid. The cost of the work billed to the CDFW grant totaled \$9,408.79, whereas

the funds provided by Caltrans for the project amounted to \$362,006,55. Thus Caltrans funded 97% of the total cost of the weir removal project. All of these fish passage enhancement projects are located upstream of the coastal zone and thus did not require coastal development permit authorization.

Since the amount of available stream habitat within the watershed generally translates into overall salmonid production, one potential way to facilitate an overall increase in fish production is to increase the quantity of spawning habitat available to adult salmon. As discussed further below, the four fish passage enhancement projects on the Mad River: main stem Mad River (Blue Lake weir removal), and Mill (culvert), Hall (fishway), and Lindsay Creeks (passage improvement) provide increased access to approximately 112 miles of salmonid spawning and rearing habitat.

The fishway that was constructed in Hall Creek in 2012 eliminated an elevation barrier at the confluence of Hall Creek and the Mad River. The new fishway is approximately 15-foot wide by 85-foot long and contains 10 vortex weirs. The fishway opens passage for all life stages of salmonids to the entire Hall Creek drainage.

Mill Creek is a tributary to the Mad River. The culvert system replaced was located on Riverside Road, approximately two miles east of the City of Blue Lake. The Mill Creek culvert replacement was completed in 2011 and opened up approximately one mile of salmonid habitat, and removed an existing migration barrier. Removal of this barrier also protects downstream habitat by reducing the possibility of high flows washing out the culvert and road fill.

Lindsay Creek is a tributary to the Mad River. The blockage removed was located under Highway 299. Caltrans utilized a crew from the California Conservation Corps in 2011 to alter the configuration of boulders at the mouth of Lindsay Creek that was obstructing passage. This work was completed in the summer of 2012.

The fourth restoration/mitigation project was removal of the Mad River Hatchery Fish weir. The weir was built in the summer of 1989 to direct Chinook salmon and steelhead into the fish ladder at the hatchery. The weir structure was never effective in directing Chinook into the ladder, and the hatchery operators ultimately determined that a weir has not been necessary to direct steelhead into the ladder. The weir started to fail during the first winter after its installation, and the weir became a low flow barrier to all salmonids and other fishes. In addition, the weir locally modified sediment transport in the river and became a safety hazard for boaters and swimmers. Caltrans determined that removing the weir could increase the rate at which fish losses were mitigated and also provide mitigation for stream channel impacts. Full passage to the entire Mad River watershed upstream of the project site was restored by removing the weir structure at the Mad River Fish Hatchery. As the weir represented a significant barrier to anadromous fish migration and contributed to water quality degradation, removal of the weir was a priority for the various federal, state, and local resource agencies. A total of 5.9 acres of stream channel was restored by removing the weir. The project was successfully implemented in 2013.

The following variables were used to estimate the productivity of the stream habitats located above the barriers proposed to be removed in the passage projects:

1. Quantity of spawning habitat above barrier, Q_{sp} (m^2)
2. Egg to fry survival rate, S_{fry} (%)
3. Fry to smolt survival rate, S_{smolt} (%)
4. Total number of juvenile salmonids lost in Mad River project, N_{lost}
5. Ratio of spawning habitat area to fry production, R_{fry} (n/m^2)
6. Total number of smolts produced, N_{prod}

To calculate the estimated total number of smolts expected to be produced through completing the proposed fish passage projects, the following equation was used:

$$Q_{sp} * R_{fry} * S_{fry} * S_{smolt} = N_{prod}$$

Caltrans used various accepted assumptions to calculate values for each variable in the calculation. Caltrans utilized conservative assumptions where possible to better ensure that projected loss estimates covered actual losses from the project. Due to the lack of specific information for the Mad River watershed several assumptions were made to obtain values for each of the variables. As part of estimating the area of spawning habitat made available by the proposed projects, an average channel width was assumed for each waterway. Since channel width varies considerably along the length of a channel, a conservative value of 1.8 m (6 ft.) was used, along with the total length of channel made passable, to calculate the area of spawning habitat made available, Q_{sp} . Survival rates for salmonid life stages in the Mad River watershed are not available. Therefore, estimates for egg to fry survival (S_{fry}) and fry to smolt survival (S_{smolt}) were obtained from peer reviewed literature. The average rate of egg to fry survival based on numerous studies reported is 10 percent. Furthermore, the survival rate from fry to smolt can range from 5 to 25 percent depending on physical conditions (e.g., water temperature, hydrology) and density-dependent factors such as food availability. An additional assumption was made on the ratio of salmon spawning habitat area to fry production, R_{fry} . Redd size varies according to species and the specific size of the female constructing the redd. In general, the larger the female, the larger the redd. Redd sizes reported for coho salmon range from 2.5 m^2 to 4.0 m^2 . Chinook salmon redds vary from 2 m^2 to 6 m^2 (Gallagher 2005, Burner 1951). Steelhead redd sizes are within the same range or slightly smaller than coho salmon. Burner (1951) recommends that the area needed for spawning salmon should be about four times the area of the redd. Based on this recommendation an area of 10 m^2 was selected to use in the production estimate.

Caltrans compared the number of smolts expected to be produced to estimates of salmonid losses that occurred during construction to determine how to achieve maximum mitigation of losses. The resulting estimates suggest that implementing the proposed fish passage produces between 165 and 826 salmon smolts per year. Using the lowest survival rate reported for survival from fry to smolt yields 165 individual smolts produced per year.

Project	Q_{sp}	S_{fry}	S_{smolt}	R_{prod}	N_{prod}
Mill	8,535	0.1	0.05	0.1	4
Hall	8,152	0.1	0.05	0.1	4
Lindsay	19,424	0.1	0.05	0.1	10
Blue Lake	294,356	0.1	0.05	0.1	147
				Total	165

Comparatively, using the highest survival rate reported, up to an estimated 826 smolts could be produced per year.

Project	Q_{sp}	S_{fry}	S_{smolt}	R_{prod}	N_{prod}
Mill	8,535	0.1	0.25	0.1	21
Hall	8,152	0.1	0.25	0.1	20
Lindsay	19,424	0.1	0.25	0.1	49
Blue Lake	294,356	0.1	0.25	0.1	736
				Total	826

The actual rate of survival of juvenile salmonids in the Mad River watershed likely fluctuates annually due to changes in environmental conditions and changes in population densities for each cohort (i.e., age class distribution) returning to spawn. Given the uncertainty associated with estimating the actual number of fish produced through the proposed projects, Caltrans used the lowest survival rate reported for survival from fry to adult and predicted that the improved habitat condition and access to upstream spawning areas would produce approximately 165 individual smolts each year. Based on this rate, it will take at least two years for the projects to fully mitigate for the loss of the 246 salmonids assumed or observed to be lost during project construction. Benefits to the population, including increased productivity, will continue for the life of the projects, and the habitat restoration projects will continue to provide improved habitat conditions and increased population size for the foreseeable future.

The Commission finds that the four habitat restoration projects implemented by Caltrans provide full mitigation for all fisheries losses for a number of reasons. The projects provide improvements to in stream fisheries habitat and access to much more habitat than the quantity of in stream fisheries habitat that was adversely impacted during the project. While the adverse impacts to in stream fisheries habitat from the Mad River Bridges replacement project were temporary, the restoration projects provide permanent improvements to in stream fisheries habitat and access to upstream spawning areas. According to post construction calculations approximately 1.03 acres of in stream habitat are projected to have been temporarily affected. Comparatively, over 6.5 acres of in stream habitat were permanently improved or restored by these habitat restoration projects. The weir removal project alone is projected to have restored more than five times the amount of stream channel that was disturbed. Furthermore, the improved in stream habitat provides access to spawning areas, which may in turn increase productivity of the population, and provide additional long-term benefits.

Additionally, the habitat restoration projects implemented in the tributary areas provide access to rearing habitat in the lower Mad River basin, which may in turn increase over summer survival and have a long term beneficial effect on all Mad River fish populations. Salmonids use tributary streams during the summer to escape from high water temperatures in main stem river environments. Providing improved access to these areas will have long term beneficial effects by increasing over summer survival and increasing population size. Habitat improvements in these areas provide a cumulative beneficial effect by restoring a variety of habitat types.

To ensure that the long term compensatory fisheries mitigation plan is implemented as approved and will achieve the stated goals of fish passage improvement, the Commission includes [Special Condition No. 5E](#). This special condition requires that the fish passage restoration projects on the Mad River at the Blue Lake Fish Hatchery weir, Hall Creek, Mill Creek, and Lindsay Creek are successfully implemented as approved. In addition, [Special Condition No. 5E](#) requires that the permittee submit for the review and approval of the Executive Director a final monitoring report that evaluates whether the fish passage restoration project conforms to the goals, objectives, and performance standards set forth in the approved compensatory fisheries mitigation plan. If the final report indicates that the mitigation project has been unsuccessful, in part, or in whole, based on the approved performance standards, the permittee must submit a revised or supplemental mitigation program to compensate for those portions of the original program which did not meet the approved performance standards. The revised mitigation program must be processed as an amendment to this coastal development permit, unless the Executive Director determines that no amendment is legally required.

Given the quantity of habitat restoration performed, the significant increase in access to spawning habitat expected to be achieved through the passage projects, and the longevity with which the projects will improve fisheries habitat and upstream access to spawning habitat, the Commission finds that the final long term compensatory fisheries mitigation plan with the habitat passage improvement projects described in the plan and with the requirements of Special Condition No. 5E that the permittee successfully implement the plan as approved and submit a monitoring plan demonstrating that the fish passage improvement projects proposed under the plan have been successful, fully mitigates for all adverse impacts to the Mad River stream channel and fisheries losses as required by [Special Condition No. 5D](#).

b. Modification of Wetland and Stream Channel Mitigation Requirements

The amendment request seeks to modify the riparian wetland mitigation requirements of [Special Condition No. 15C](#) to allow use of the Caltrans Elk River Mitigation Bank as an off-site wetland mitigation location and reduce the compensatory riparian wetland mitigation replacement ratio from 4:1 to 3.4:1. [Special Condition No. 15](#) as originally imposed requires that the permittee submit for the review and approval of the Executive Director a revised wetland mitigation plan for wetland riparian loss and stream channel impacts from project activities. The plan is required to provide that all impacts to riparian corridor wetland soils or vegetation that last longer than twelve months be mitigated at a minimum ratio of 4:1. Mitigation must be provided on site to the extent feasible and within the watershed of the Mad River if mitigation must be provided off-site. Special Condition No. 15 also requires that the plan provide that stream channel bottom impacts from construction activities be mitigated at a minimum ratio of 1:1, with the channel impacts calculated annually and added cumulatively.

Caltrans has submitted a revised wetland mitigation plan to the Executive Director in advance of the permit amendment request being acted upon by the Commission which is attached as Exhibit 9. Upon Commission approval of the permit amendment, the submitted wetland and stream channel mitigation plan will be reviewed by the Executive Director to determine if the plan satisfies the requirements of [Special Condition No. 15](#), as amended.

As approved under CDP 1-07-013, the Mad River Bridges Replacement Project was projected to result in approximately 1.72 acres of permanent and temporary impacts to coastal wetlands during project years 1-4. However, on May 30, 2012, during a joint review of the project site with Coastal Commission staff, Caltrans observed that the temporary impacts were actually less than anticipated. Contrary to what had been expected, the site visit revealed that no temporary impacts actually occurred within the projects N/E quadrant (projected at 0.21 acres). Therefore, the actual amount of wetlands requiring mitigation is reduced from 1.72 acres to 1.51 acres. This reduced amount reflects the actual impacts as measured on the ground by Caltrans.

The revised wetland mitigation plan that has been submitted for the review and approval of the Executive Director proposes a combination of on-site and off-site mitigation, with the off-site mitigation being provided at two separate locations. The plan proposes to reestablish 1.57 acres of riparian wetland on site, largely in the location of where a portion of one of the former highway bridges was removed. Off-site, the plan proposes to create two acres of riparian vegetation habitat on a parcel located southwest of Arcata on an agricultural parcel off of Highway 255 known as the Old Samoa parcel. Under the original permit, Caltrans proposed to use a total of 5.4 acres of the Old Samoa parcel for off-site mitigation. The Commission staff ecologist reviewed the proposal and concurred that planting up to two acres along the street edge of the property would provide cover and habitat for some species and would also provide a buffer from disturbance for the remainder of the parcel. However, the Commission determined that the use of the Old Samoa parcel for more than two acres of mitigation along the highway side of the property would impermissibly convert agricultural lands inconsistent with Coastal Act Section 30242. For this reason, Caltrans was required to identify an additional site on which to perform the remaining off-site wetland mitigation.

The submitted revised wetland mitigation plan now proposes to satisfy the remaining off-site wetland requirements of [Special Condition No. 15](#) by utilizing the remaining 1.53 acres of available mitigation credit at the Caltrans Elk River Mitigation Bank. The 17-acre mitigation bank is located along Highway 101 along the lower reaches of the Elk River near its confluence with Humboldt Bay. The mitigation bank was established in 1980 pursuant to a Memorandum of Understanding (MOU) between Caltrans, the Commission, and CDFW. The bank was originally created to mitigate for two Caltrans highway projects in the coastal zone including the construction of a bridge along Highway 255 at Mad River Slough (CDP No. 79-P-75) requiring two acres of mitigation, and a freeway project along Highway 101 at Elk River (CDP No. A-79-75) requiring nine acres of mitigation. The MOU specifies that the remaining acreage in the bank shall be available for future use as mitigation for other Caltrans projects. The Elk River mitigation site is composed of mostly high salt marsh that is inundated by tides on average approximately 35 times per year. The marsh was created by breaching levees surrounding what was farmed seasonal wetlands prior to 1980. Pursuant to the MOU, title to the mitigation bank property and the responsibilities for managing the site were transferred from Caltrans to CDFW.

Caltrans conducted a 10-year monitoring program at the mitigation bank site to document the anticipated change from diked pasture and other upland habitats to salt marsh habitat. The last monitoring report prepared in 1989 indicates that breaching the dikes and allowing natural vegetative changes to occur had been effective in restoring high salt marsh habitat at the site. The site is vegetated with salt marsh species including pickleweed (*Salicornia virginica*), salt rush (*Juncus sp.*), hairgrass (*Deschampsia caespitosa*), potentilla (*Potentilla egedei*), and saltgrass (*Distichlis spicata*).

Wildlife usage of the site is greatest by various bird species including Northern shoveler, Great blue heron, Great egret, Belted kingfisher, Long-billed marsh wren, Barn swallow, Osprey, and Double-crested cormorant. The Caltrans monitoring indicated that the area provides wetland habitat for many species of plants and animals.

In 2002, Caltrans prepared a vegetation survey of the Elk River Mitigation Bank site. The survey was conducted to satisfy the special conditions of a permit for a separate Caltrans highway project that utilized credits at the bank for wetland mitigation (See pages 28-31 of Exhibit 9. The survey involved observations of wetland vegetation types and percent cover within quadrants along transects laid out throughout the restored wetland area at the bank. The survey demonstrates that the restoration site is dominated by wetland vegetation as 29 of the 34 quadrants surveyed contained 100% wetland vegetation and the remaining five quadrants contained over 50% wetland vegetation. The survey also documents that the site is inundated by tides an average of approximately 35 times per year, with additional inundation due to both rainfall and tides resulting in inundation of as much as an additional 5-10 days per year. The survey also determined that the soils at the restoration site are hydric. The survey indicates that the breached area of the levees remain in stable condition and continue to function. Finally, the survey concludes that the mitigation site provides wetland habitat for many species of plants and animals.

The Commission finds that the Elk River Mitigation bank is an appropriate location to provide a portion of the off-site wetland mitigation and provide successful wetland restoration. The Elk River Mitigation Bank was constructed over 20 years ago and the wetlands in it are fully functional. Implementing wetland mitigation at an already established mitigation bank where the wetlands have already been restored helps ensure the mitigation is successful and is provided in a shorter amount of time. In addition, given the limited number of areas where wetland mitigation can take place, the Commission finds that implementing wetland mitigation in riparian flood plain habitat within and around the Elk River Mitigation Bank where wetlands have been previously established and success rates are high is preferable to implementing wetland mitigation in many upland areas in the Mad River basin allowed under the original permit condition where the mitigation would not be as successful.

Therefore, the Commission modifies the requirements of Special Condition No. 15 to allow off-site mitigation to be provided at the Elk River Mitigation Bank. To ensure that the proposed debit to the bank is accounted for by the owner/operator of the Elk River Mitigation Bank, the California Department of Fish and Wildlife, Special Condition No. 15 as modified requires that within 90 days of the approval of the final Wetland and Stream Channel Mitigation Plan by the Executive Director, Caltrans shall inform CDFW in writing of the extent of any wetland credit taken from the Elk River Mitigation Bank for use in the approved final Wetland and Stream Channel Mitigation Plan, and (2) shall submit to the Executive Director an accounting from CDFW of the balance of wetland mitigation credits at the Elk River Mitigation Bank after use of credits for the approved final Wetland and Stream Channel Mitigation Plan.

Considerations regarding temporal loss and likelihood of success of mitigation were significant parts of the reason the Commission imposed a mitigation ratio of 4:1 in the original permit rather than a simple 1:1 ratio of wetland mitigation to wetland fill. As temporal loss and likelihood of success are not significant considerations with regard to the portion of the wetland fill for the

project that would be mitigated by use of the 1.53 acres of available credit at the Elk River Mitigation Bank, Caltrans requests that the mitigation ratio required by Special Condition No. 15 be reduced by a corresponding amount. Caltrans requests that the ratio be reduced from 4:1 to 3.4:1. As amended, the proposed wetland mitigation (with the Elk River mitigation bank) will result in approximately 5.1 acres of restored wetlands at an overall 3.4:1 ratio.

The Commission finds that in this particular case, the proposed wetland mitigation ratio of 3.4:1 (wetlands restored to wetlands filled) is appropriate. Given: (1) the high quality of wetlands that have been created at the bank; and (2) the decrease in temporal loss from crediting the creation of wetlands at an established mitigation bank as mitigation, the reduced ratio of wetland mitigation still provides sufficient mitigation for wetland impacts. Although the wetland ratio will be reduced, the overall success rate and long term wetland creation will fully mitigate for all impacts to wetlands that occurred during original project activities.

Conclusion

The Commission finds, as conditioned herein, the amended project is consistent with the requirements of Section 30233 of the Coastal Act in that feasible mitigation measures have been provided to minimize adverse environmental effects. The mitigation measures and final mitigation plans imposed through **Special Condition Nos. 5 and 15** as amended are designed to fully mitigate, enhance and restore in stream channel habitat, fisheries losses and adverse impacts to wetlands. Therefore, the amended development, as conditioned, is consistent with the requirements of Section 30233 of the Coastal Act.

E. CALIFORNIA ENVIRONMENTAL QUALITY ACT

On June 17, 2005, Caltrans as lead agency, certified Mitigated Negative Declaration (SCH 2003122015) for the subject Mad River Bridges Replacement Project, which incorporated the published responses of Caltrans to public comments.

Section 13096 of the Commission's administrative regulations 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 requirement 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 conformity with Coastal Act policies 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 amendment 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 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 development, as conditioned to mitigate the

identified impacts, can be found to be consistent with the requirements of the Coastal Act to conform to CEQA.

APPENDIX A:
SUBSTANTIVE FILE DOCUMENTS

County of Humboldt Local Coastal Program

Coastal Development Permit Application File No. 1-07-013

Coastal Development Permit Application File No. 1-07-013-A1

Coastal Development Permit Application File No. 1-07-013-A2

Memorandum of Understanding between Caltrans, Coastal Commission, and California Dept. of Fish and Game for Creation and Use of Caltrans Elk River Mitigation Bank

Coastal Development Permit Application File No. 79-P-75

Coastal Development Permit Application File No. A-79-75

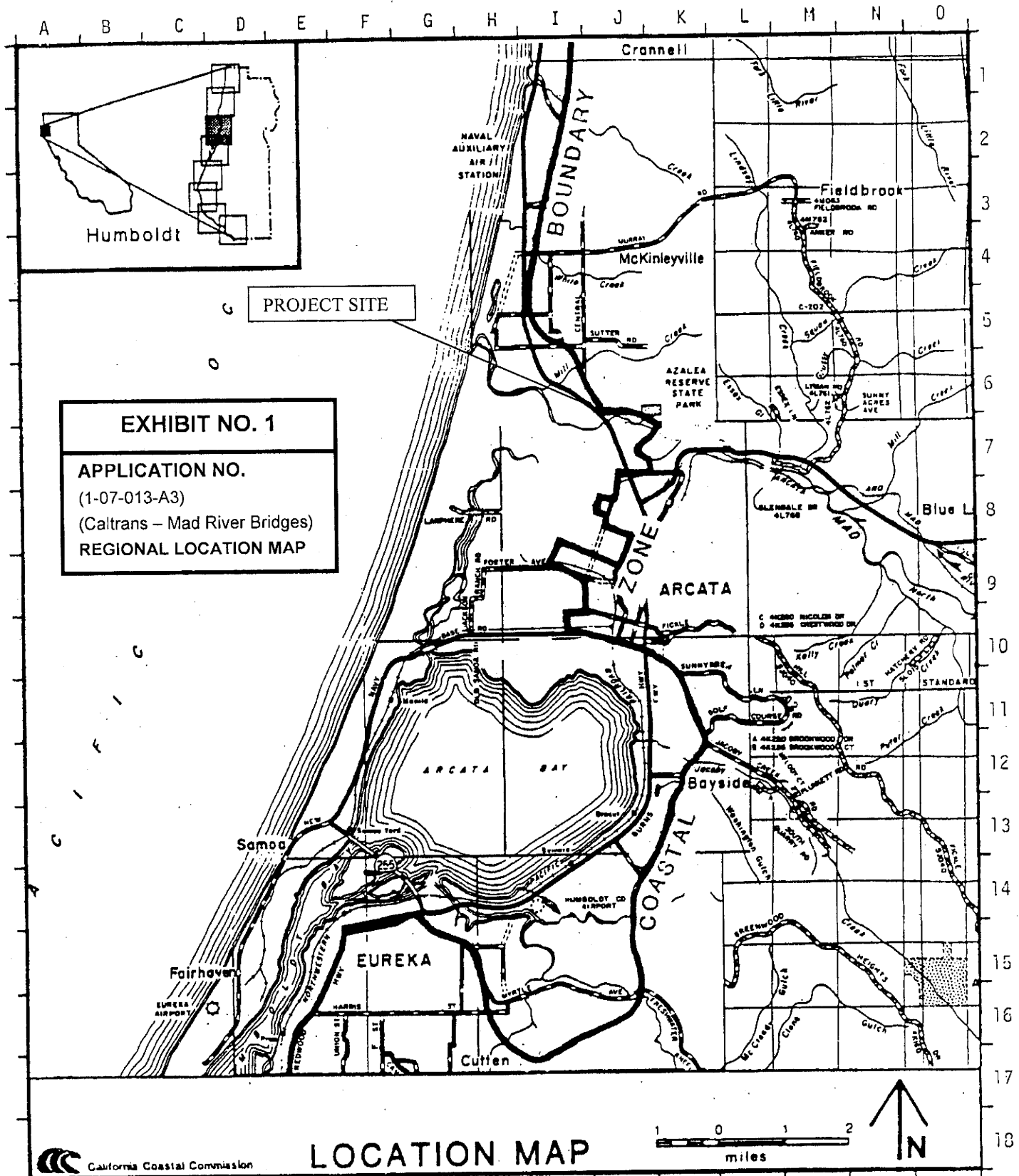
Coastal Development Permit Application File No. 1-02-016

Hall Creek Mad River Fish Passage Mitigation Final Report, Caltrans, 2013

Mill (Watek) Creek Culvert Replacement Final Report, Caltrans

Blue Lake Mad River Weir Removal Mitigation Project, Project Completion Report, Humboldt County Resource Conservation District, November 2013

Letter dated July 22, 2014, from Donna Chambers, Executive Director of Humboldt County Resource Conservation District to Susan Leroy, Caltrans, regarding: 01-HUM-101 PM 89.1/90.4 Mad River Bridges Replacement – Channel Mitigation, EA: 01-296104, District Agreement No. 01-0368



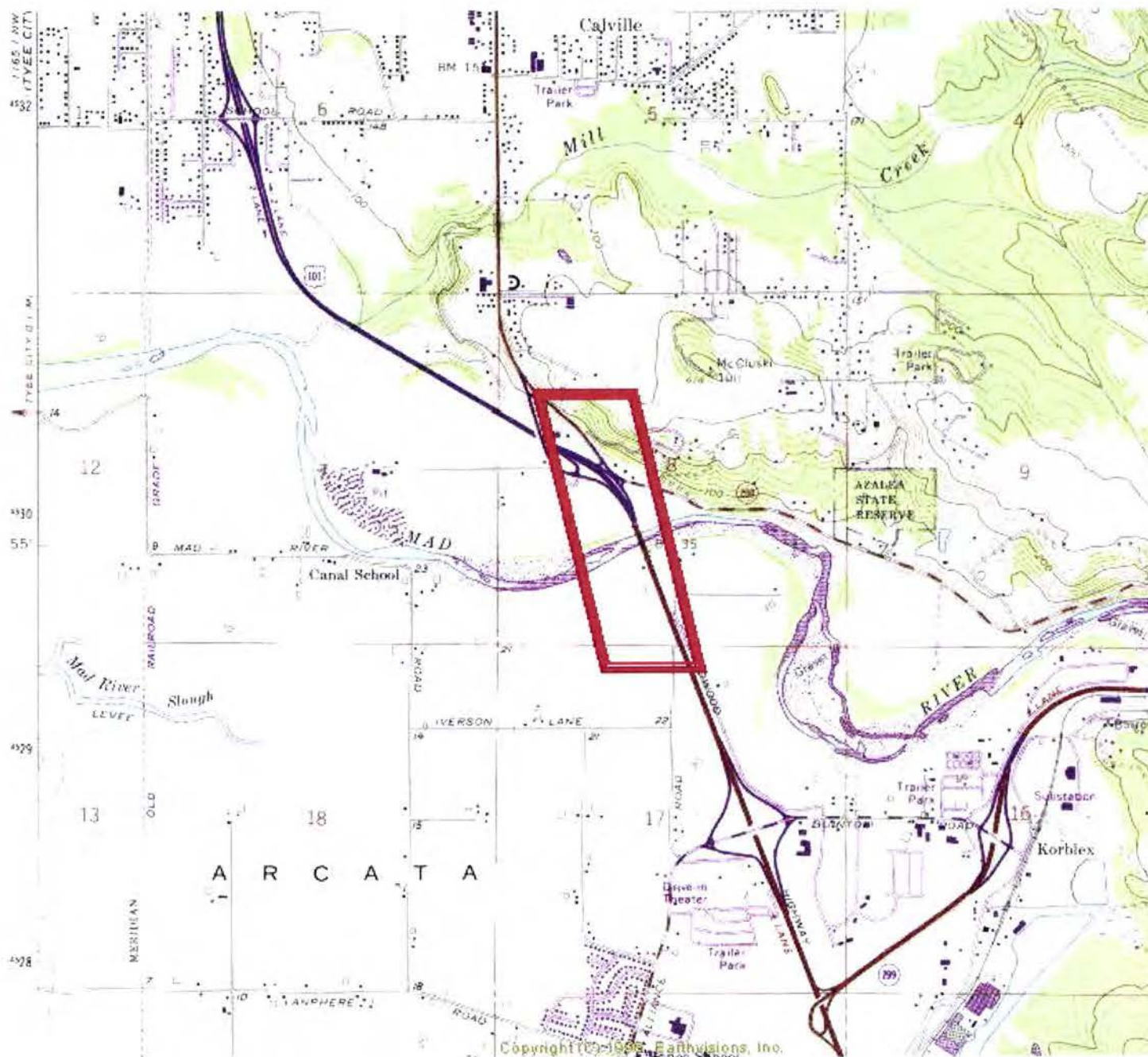


Exhibit 2. PROJECT SITE, portion of the USGS Arcata North quadsheet

Long Term Compensatory Fisheries Mitigation Plan

Mad River Bridges, November 27, 2012

Project Background

The Federal Highway Administration (FHWA) and California Department of Transportation (Caltrans) has replaced the U.S. Highway 101 bridges that cross the Mad River between Arcata and McKinleyville, California. The project was constructed so that the bridges meet current seismic, scour, and bridge design standards. All work within and adjacent to the river channel, other than revegetation, was completed in October 2012.

The new bridges are constructed on two abutments (abutments 1 and 5, at the south and north ends of the bridges, respectively) and are supported by three piers (piers 2, 3, and 4). Each pier was constructed by driving two 7-foot-diameter cast-in-steel-shell (CISS) piles with an impact pile-driver. Although none of the piles were driven in water, the piles for Piers 3 and 4 and the falsework piles were close enough to the river to transmit sound to the water. Piles at piers 3 and 4 were driven in 2009 and 2010. In addition to pile-driving, the project included temporary earthwork within the channel to provide workspace for the installation of the piles; bridge demolition; installation, operation, and removal of a temporary fish exclusion system during the driving of piles at Piers 3 and 4; and construction of temporary access roads to the site.

The Mad River provides habitat for three types of anadromous salmon:

- Chinook salmon (*Oncorhynchus tshawytscha*)
- Coho salmon (*O. kisutch*)
- Steelhead trout (*O. mykiss*)

The area of the project is used primarily as a migration corridor for both adult and juvenile salmon as they migrate to and from marine and freshwater habitats for spawning and rearing. In-channel work windows were established prior to construction in order to avoid direct impacts from underwater noise produced during pile driving as well as other in-water construction activities. Pile driving was permitted to occur only between July 1 and September 1 annually to avoid the period when adult salmonids would be migrating through the project area (September through January), and to avoid the peak juvenile out-migration period of March through June. The above work window was implemented to avoid and minimize fish presence; however, additional minimization measures were taken within the work window to further prevent injury or mortality either from underwater noise or entrapment or impingement by materials and equipment during in-water work.

1 OF 11

EXHIBIT NO. 3
APPLICATION NO.
1-07-013-A3 - CALTRANS
FISHERIES MITIGATION
PLAN (1 of 11)

Mitigation Calculation

Mitigation for juvenile salmonids injured or killed during project activities is based on units of biological production, as outlined in the July 30, 2008 memo submitted to the California Coastal Commission. The mitigation premise is that an individual fish within the Mad River population contributes to overall fish production by finding suitable spawning habitat within the watershed for the incubation and emergence of offspring. Since the amount of available stream habitat within a watershed generally translates into overall salmonid production, one potential way to facilitate an increase overall fish production is to increase the quantity of spawning habitat available to adult salmon. Therefore, Caltrans has committed to four fish passage enhancement projects on the Mad River: main stem Mad River (Blue Lake Weir removal), and Mill (culvert), Lindsay (removal of boulder barriers), and Hall (placement of weirs and baffles) Creeks, to mitigate for the loss of juvenile salmonids during construction. These projects will provide increased access to approximately 112 miles of salmonid spawning and rearing habitat. In the analysis presented in this plan, the number of smolts expected to be produced through the implementation of these projects will be compared to estimates of salmonid losses during construction.

The amount of fish production that would be gained by implementing the fish passage projects listed above will be calculated to determine if increases in productivity through increased access to suitable habitat are sufficient to offset project losses. The following variables will be used to estimate the productivity of the stream habitats located above the current barriers proposed to be removed in the passage projects:

1. Quantity of spawning habitat above barrier, Q_{sp} (m²)
2. Egg to fry survival rate, S_{fry} (%)
3. Fry to smolt survival rate, S_{smolt} (%)
4. Total number of juvenile salmonids lost in Mad River project, N_{lost}
5. Ratio of spawning habitat area to fry production, R_{fry} (n/m²)
6. Total number of smolts produced, N_{prod}

The number of smolts produced by increasing available fish habitat will be calculated as:

$$Q_{sp} * R_{fry} * S_{fry} * S_{smolt} = N_{prod}$$

The number of smolts produced, N_{prod} will have to equal or exceed the number of smolts lost, N_{lost} in order for the fish passage mitigation projects to offset project losses.

Construction activities that could directly injure or kill juvenile and adult salmonids (i.e., losses) from 2009 through 2012 include:

- Installing and dewatering cofferdams around pile installation locations

- Installing gravel bar extension along southbank (2009, 2010, 2011) and northbank (2011 and 2012)
- Installing and clearing a fish exclusion zone (2009 and 2011)
- Installing support piles for Piers 2, 3, and 4
- Removal of old bridge footing at pier 7 and removal of column at pier 8

The number of fish lost (injured or killed) during each construction year was estimated from observations reported in the following documents:

1. Snorkel Survey Reports for 2009 and 2011
2. Biological Monitoring Reports prepared for construction seasons 2009, 2010, and 2011
3. Mad River Bridges Replacement Project, Effects of Pile Driving Sound on Juvenile Steelhead, March 2010
4. Hydroacoustic Monitoring Reports for pile driving in 2009 and 2011
5. Notes from the Biological Monitor in 2012.

Estimate of Fish Losses

2009

Construction activities within the channel in 2009 included:

- Installation and removal of gravel bar extension along the south bank of the Mad River
- Installation of permanent piles at piers 2, 3, and 4.

Gravel Bar Extension

Installation of the gravel bar extension along the south bank began on June 16, 2010. The purpose of the extension was to provide access to the in-water and overhead construction areas for the installation of falsework and to provide a stable work surface for heavy equipment. Prior to the installation of gravel into the wetted channel, fish within the area to be filled were removed first by seining and then electrofishing. The area was surveyed via snorkeling to ensure that all fish had been removed from the area.

Based on observations reported in the *2010 Mad River Bridges Biological Monitoring Report*, no salmonids were injured or killed during the installation of the south bank gravel bar extension. However, it is likely that a large number of juvenile lamprey (ammocoetes) was buried in the native substrate as a result of gravel installation.

Pier Installation

A fish exclusion zone (FEZ) was established prior to pile driving, and fish were relocated during its installation. Snorkel surveys were conducted after fish were removed from the FEZ to estimate the

number of fish remaining. The remaining fish were subsequently exposed to underwater noise levels greater than 187 dB SEL AC and are to be considered killed per CDP Condition 4A(1).

In 2009, the FEZ was in operation for a total of 47 days from June 30th to August 5th. After fish were removed, it was estimated that 87 juvenile salmonids (*Mad River Bridges Snorkel Survey Report 2009*) remained within the FEZ (Table 1). These fish were exposed to peak underwater noise levels that ranged from 151 dB re μ Pa to 194 dB re μ Pa, and accumulated SEL levels in excess of 187 dB AC SEL on three occasions 35 meters from pile driving (i.e., nearest hydrophone location) (*2009 Mad River Bridges Hydroacoustic Monitoring Report*). Caged fish studies performed concurrently showed no injury to, or mortality of, individual fishes exposed to the highest underwater noise levels produced in 2009 (*Effects of Pile Driving on Juvenile Steelhead, March 24, 2010*). However, fish utilized in those studies were euthanized immediately after each experimental trial. Therefore, it is uncertain whether any delayed mortality of exposed fish occurred as a consequence of exposure to pile driving noise.

In addition, one coho salmon was killed during electrofishing to clear the FEZ. Mortality was also associated with impingement on the nets used to exclude fish from the FEZ once it was cleared (Table 1). It is possible that the impingement mortality may have been a result of high water temperatures and late migrating smolts, since similar rates were not observed under relatively more favorable river conditions (i.e., higher flows, lower water temperatures) during exclusion in 2011 (*2009 Mad River Bridges Biological Monitoring Report*).

Generally, Chinook salmon smolt emigration generally decreases annually in late-May to early-June coincidently with late spring flows. In 2009, flows in the Mad River were lower (below 500 cfs) during this period than those experienced in 2011. In addition, water temperatures in the Mad River taken within the project area during this time exceeded 70°F (21°C) on most days (recorded in daily biological monitoring notes) while the FEZ was in operation. During the parr-to-smolt transformation process juvenile salmonids undergo significant changes in their physiology to prepare for life in a marine environment. This physiological stress can be magnified by increased water temperatures. Exposure to water temperatures in excess of 70°F (21°C) for several hours over consecutive days can cause reduced feeding activity as well as losses in equilibrium (McCullough 1999). Losses in equilibrium and general lethargy caused by environmental stressors could affect the ability of smolts to swim away from obstacles or decrease their ability to free themselves if impinged on a net. Therefore, it is conceivable that increased water temperatures, combined with a relatively large number of late-emigrating smolts in a weakened physiological state, resulted in an increased number of salmonid mortalities being observed at the FEZ nets in 2009.

Table 1: Number of juvenile salmonids injured or killed during 2009.

Cause of Mortality	Coho (n)	Steelhead (n)	Chinook (n)	Unknown Salmonid	Total (N)
Remained in FEZ during pile driving	46	35	6	-	87
FEZ Structures	3	13	28	24	68
Fish removal activities (e.g., seining, electrofishing)	1	-	-	-	1
Total Lost in 2009	156				

2010

Construction activities within the channel in 2010 included:

- Installation and removal of gravel bar extension along the south bank of the Mad River
- Installation of falsework piles along the north bank

Gravel Bar Extension

Installation of the gravel bar extension along the south bank began on June 16, 2010. The purpose of the extension was to provide access to the in-water and overhead construction areas for the installation of falsework and to provide a stable work surface for heavy equipment. Prior to the installation of gravel into the wetted channel, fish within the area to be filled were removed first by seining and then by electrofishing. The area was snorkeled to ensure that all fish had been removed.

Based on observations reported in the *2010 Mad River Bridges Biological Monitoring Report*, no salmonids were injured or killed during the installation of the south bank gravel bar extension. However, it is likely that a large number of juvenile lamprey were buried in the native substrate as a result of gravel installation.

Falsework Installation

On July 1, 2010 eight 22-inch diameter steel shell piles were installed along the north bank using a vibratory hammer. Each pile was struck approximately three times using a diesel impact hammer to ensure its stability. Hydroacoustic monitoring was conducted 10 meters and 20 meters from pile driving to ensure that underwater noise levels did not exceed NMFS dual metric criteria (i.e., accumulated SEL of 187 dB re 1 μ Pa²-sec; peak of 206 dB re: 1 μ Pa).

Neither the accumulated SEL criterion of 187 dB re 1 μ Pa²-sec nor the peak criteria of 206 dB re: 1 μ Pa was exceeded at the measurement locations. Therefore, there were no fish injured or killed as a result of pile driving activities in 2010.

2011

Construction activities within the channel in 2011 included:

- Installation and removal of temporary in-river diversions along south bank work platform and north bank falsework pad
- Installation of permanent piles at Piers 3 and 4

Diversions and Falsework Pad

An instream diversion and gravel-filled work area on the south riverbank was constructed to provide access to the in-water and overhead construction area; for placement of falsework bent pads; and to provide a work platform for a crane and other equipment. In addition, a gravel pad was constructed behind sheet piles on the north bank for placement of a falsework pad.

The diversion on the southbank was installed in two stages. The first stage of the south-side diversion began on June 16 and was approximately 80 feet long parallel to the river and extended into the wetted channel approximately 30 feet at the upstream end and 65 feet at the downstream end. Construction of the second phase began on June 28 and extended the south-side diversion by approximately 30 feet into the river, leaving an open channel that varied in width between approximately 40 and 50 feet.

The biological monitor (Mike Kelly) examined the K-rails and sheet piles to be sure they were free of contaminants, and observed their placement. The biological monitor and Caltrans fishery biologist Samantha Hadden then used a beach seine and electrofishing equipment to clear fish from the areas to be filled. They removed one juvenile coho salmon, one adult stickleback, and six lamprey ammocoetes from the first stage of the south-side diversion and two Chinook salmon smolts, two juvenile steelhead, 10 sticklebacks, 10 juvenile lamprey, and a sculpin from the second stage of the south-side diversion. They found no fish within the north-side diversion. The diversions along the north and south banks resulted in no direct losses of juvenile salmonids.

Turbidity plumes were created during placement and removal of the diversion barrier sheet pile and K-rail containment structures, and the vibratory hammer developed a minor leak (estimated at less than 3 ounces), which was immediately addressed. The biological monitor did not observe any stressed fish either during turbidity pulses or during the oil leak. Juvenile steelhead continued feeding during all but the most intense turbidity pulses. Water temperatures ranged from 12 to 17°C, during the more significant turbidity events, and up to 19°C during the minor events. Therefore, turbidity did not coincide with the warmest water, which ranged up to 23°C during the season. There were no observed or reported fish losses in 2010 with the exception of an unknown number of lamprey which were likely trapped by diversion structures.

Pier Installation

Fish were cleared from the FEZ using multiple passes with one or two beach seines depending on the width of the reach. When the seine approached the downstream end of the FEZ, a section of the downstream weir was opened temporarily, allowing fish to be crowded out of the FEZ. Fish biologists from ICF International snorkeled the FEZ between seine passes to ensure that only the allowable number of fish, approximately 87 ESA-listed salmonids (i.e., salmonids protected under the Endangered Species Act) remained within the FEZ (*Snorkel Survey Report 2011*).

Fish that remained in the FEZ during pile driving were subjected to elevated sound levels. No dead fish washed up on the downstream weir nor was there other evidence (e.g., altered behavior) suggesting that acoustic injury occurred to fish remaining in the FEZ. However, three Chinook salmon smolts and one juvenile steelhead were apparently killed on the upstream FEZ weir mesh (Table 2).

Table 2: Number of juvenile salmonids injured or killed during 2011

Cause of Injury/Mortality	Coho (n)	Steelhead (n)	Chinook (n)	Unknown Salmonid	Total (N)
Remained in FEZ during pile driving	-	-	-	87	87
FEZ Structures			3		3
Total Lost in 2011					90

2012

Construction activities within the channel in 2012 included:

- Installation and removal of temporary in-river diversions along south bank work platform and north bank falsework pad during bridge demolition.
- Installation of the habitat structure at Pier 8.

Diversions and Falsework Pad

Golden State Bridge (GSB) constructed an instream diversion and gravel-filled work area on the south river bank to provide access to the in-water and over-head construction area and for placement of a falsework bent pad. The contractors also constructed a gravel pad behind Pier 8 for demolition access and containment and for access to build the Pier 8 habitat structure.

Construction of the south side diversion began on August 8 and was completed on August 9. The south side diversion was approximately 65 feet long parallel to the river and extended into the wetted channel approximately 20 feet at the upstream end, and 40 feet at the downstream end. Maximum water depth was approximately three feet at the outer downstream corner, and averaged probably less than one foot deep. GSB used a double row of concrete K-rails with a heavy plastic sheet lining the space between the rails on all three sides. Gravel bags were put on top of the K-rails to build up extra

height above the water level on the outside section. The bottom of the plastic liner was lined with gravel bags, and the space was filled with water to create hydrostatic pressure to seal the gaps between and under the K-rails. Then 100 cubic yards of washed river rock was placed into the enclosure to form the first work pad.

The north side pad between Pier 8 and the river bank was constructed on August 23. This pad filled an oval scour hole with surface dimensions of approximately 40 feet by 60 feet, and with a maximum depth of approximately 6 feet. GSB used 108 cubic yards of washed river rock to fill the hole. A rubber pond liner was placed into a depression in the gravel and covered with a layer of gravel. The pond liner provided a secondary containment in case the primary saw-cut slurry containment failed, as it apparently did last year. The primary containment was a trough around the base of the pier constructed from additional pond liner material and lumber. The edges of the trough were sealed with caulk.

GSB removed the south-bank diversion on September 17 and 18. On the first day imported gravel from around the inside of the concrete K-rails was excavated down to the water surface. Then the K-rails, gravel bags, and plastic sheet liners were removed the next day. On the north side the pond liner and primary containment were removed on September 20. The gravel fill was left in the hole until October 10 for access to build the log habitat structure.

Impacts on Species

Placement of the gravel fill and diversion structures undoubtedly buried lamprey ammocoetes in the native substrate and temporarily eliminated approximately 4000 square feet of mud, sand, and gravel substrate habitat. Turbidity pulses associated with diversion removal were minor and short lived, and never spanned the full channel width. The minor turbidity plumes on the south side were detectable 100 feet downstream for 4 hours.

The biological monitor did not observe any stressed fish, and juvenile steelhead continued feeding during these turbidity pulses. Water temperatures ranged from 15 to 18 degrees C during the turbidity events. Therefore, turbidity did not coincide with the warmest water, which had ranged up to 23 degrees C during previous construction seasons. These lower temperatures likely helped minimize potential adverse impacts on salmonids. Additionally, the gravel left behind is perceived by NOAA Fisheries as beneficial since gravel of that size is no longer common in the lower Mad River.

On the south side diversion the biological monitor examined the K-rails to be sure they were free of contaminants, and observed their placement. Then the biological monitor and Caltrans fishery biologist Samantha Hadden, with help from GSB's crew, used a beach seine and electrofishing equipment to clear fish from the area to be filled. Forty juvenile sticklebacks, three sculpins, and 25 lamprey ammocoetes were removed from the area. No salmonids were observed in diversion area before or after the K-rails were placed.

The north side scour hole was contained behind the Pier 8 footings on the river side, and existing gravel and large rock at the upstream and downstream ends. GSB filled the gap between the two old bridge piers with a concrete "eco-block", gravel bags, and filter fabric liner. The biological monitor removed five sculpin, three lamprey ammocoetes, and four yellow-legged frogs as the hole was filled. No salmonids were observed in the hole before it was filled.

Due to minimization and avoidance measures there were no salmonids injured or killed during in water activities during the 2012 construction season.

Compensation for Fisheries Losses

Steelhead, Coho and Chinook Salmon

A total of 246 salmonids were assumed or observed to be lost during construction from 2009 to 2011 (Table 1 and Table 2). In order to calculate the estimated total number of smolts expected to be produced through completing the fish passage projects being proposed, the following equation was used (as described previously in "Mitigation Calculation"):

$$Q_{sp} * R_{fry} * S_{fry} * S_{smolt} = N_{prod}$$

Several assumptions were made to obtain values for each of the variables, due to the lack of specific information for the Mad River watershed. As part of estimating the area of spawning habitat made available by the proposed projects, an average channel width was assumed for each waterway. Since channel width varies considerably along the length of a channel, a conservative value of 1.8 m (6 ft) was used, along with the total length of channel made passable, to calculate the area of spawning habitat made available, Q_{sp} .

Survival rates for salmonid life stages in the Mad River watershed are not available. Therefore, estimates for egg to fry survival (S_{fry}) and fry to smolt survival (S_{smolt}) were obtained from peer reviewed literature. The average rate of egg to fry survival based on numerous studies reported by Bradford (2005) is 10 percent. Furthermore, the survival rate from fry to smolt can range from 5 to 25 percent depending on physical conditions (e.g., water temperature, hydrology) and density-dependent factors such as food availability.

An additional assumption was made on the ratio of salmon spawning habitat area to fry production, R_{fry} . Redd size varies according to species and the specific size of the female constructing the redd. In general, the larger the female, the larger the redd. Redd sizes reported for coho salmon range from 2.5 m² to 4.0 m². Chinook salmon redds vary from 2 m² to 6 m² (Gallagher 2005, Burner 1951). Steelhead redd sizes are within the same range or slightly smaller than coho salmon. Burner (1951) recommends that the area needed for spawning salmon should be about four times the area of the redd. Based on this recommendation an area of 10 m² was selected to use in the production estimate.

The resulting estimates suggest that implementing the proposed fish passage will produce between 165 and 826 salmon smolts per year. Using the lowest survival rate reported for survival from fry to smolt yields 165 individual smolts produced per year (Table 3).

Table 3. Increases in annual production through implementation of the proposed projects using a 5 percent survival rate.

Project	Q _{sp}	S _{fry}	S _{smolt}	R _{prod}	N _{prod}
Mill Cr	8,535	0.1	0.05	0.1	4
Hall Cr	8,152	0.1	0.05	0.1	4
Lindsay Cr	19,424	0.1	0.05	0.1	10
Blue Lake Weir	294,356	0.1	0.05	0.1	147
Total					165

Comparatively, using the highest survival rate reported, up to an estimated 826 smolts could be produced per year (Table 4). The actual rate of survival of juvenile salmonids in the Mad River watershed likely fluctuates annually due to changes in environmental conditions and changes in population densities for each cohort (i.e., age class distribution) returning to spawn.

Table 4. Increases in annual production through implementation of the proposed projects using a 25 percent survival rate.

Project	Q _{sp}	S _{fry}	S _{smolt}	R _{prod}	N _{prod}
Mill Cr	8,535	0.1	0.25	0.1	21
Hall Cr	8,152	0.1	0.25	0.1	20
Lindsay Cr	19,424	0.1	0.25	0.1	49
Blue Lake Weir	294,356	0.1	0.25	0.1	736
Total					826

Given the uncertainty associated with estimating the actual number of fish produced through the proposed projects, it is prudent to be conservative and use the lower rate of survival. Based on this rate, it will take at least two years for the projects to fully mitigate for losses during construction.

The passage projects proposed are in various stages of development. Mill Creek culvert remediation was completed during the summer of 2011. Representatives from NMFS and CDFG determined that the scope of work needed to provide adequate passage for all life stages of salmonids at Lindsay Creek could be reduced. Caltrans utilized a crew from the California Conservation Corps in 2011 to alter the configuration of boulders at the mouth of Lindsay Creek that was obstructing passage. This work was completed in the summer of 2012. The fishway at Hall Creek was completed in 2012. All the proposed projects have received concurrence as well as technical support from NMFS and CDFG.

Removal of the weir at Blue Lake was not originally proposed as mitigation for the Mad River Bridges replacement project. Caltrans determined that implementing the project could increase the rate at which fish losses were mitigated, and also provide mitigation for stream channel impacts. The removal of the Blue Lake weir was chosen because both NOAA Fisheries and the CA Dept of Fish & Game consider it a high priority for the watershed. The project will be implemented by the Humboldt County Resource Conservation District (HRCD) and is included in the 2012 CDFG Fisheries

Restoration Grant Program permits and consultations. The project will be fully funded by Caltrans through an inter-agency cooperative agreement with the HRCDD.

Other Affected Species

During the 2009, 2010, 2011, and 2012 in-channel construction seasons the presumed burial of lamprey ammocoetes during the installation of gravel is the only known direct impact to aquatic species other than salmonids. However, it is not known how many juvenile lamprey could have been killed or injured. Lamprey occupy many of the same rivers and tributaries as salmonids on the west coast. As a result, it is believed that any project undertaken to improve habitat quantity and/or quality for salmonids will also benefit lamprey and potentially offset any adverse impact to that species during construction. Therefore, no additional mitigation for lamprey species is currently proposed.

References

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Memorandum

To: California Coastal Commission

Date: December 07, 2007

File No.: HUM 101/EA # 296101

From: Samantha Hadden, Fisheries Biologist, Jones & Stokes
North Region Environmental Services, Branch E2

Subject: Mad River Bridges Replacement Project Potential Fisheries Mitigation Sites

Fisheries mitigation is being proposed by Caltrans to mitigate for the potential take of listed salmonids during pile driving activities during the replacement of the Mad River Bridges on Highway 101 in Humboldt County. Worst case planning estimates for potential bioacoustic impacts to listed salmonids due to pile driving have been developed. However, the extent of potential take will not actually be known until after the project has been completed. Caltrans has proposed a number of measures to avoid and minimize potential take of listed salmonids during piles driving (i.e., fish exclusion). Caltrans estimates that with the implementation of exclusionary devices at the site during project construction take of listed species can be reduced by 88-92%.

The following is a list and summary of potential fish passage mitigation sites within the Mad River watershed that is proposed and developed in coordination with Humboldt County Public Works and the California Department of Fish and Game (CDFG). The type of fisheries mitigation proposed is adult fish passage. However, in many cases juvenile salmonid passage also will be improved. The quantity of mitigation that will be required has not been yet determined as it will be a function of the number of listed salmonids estimated to be impacted during pile driving activities. This estimate will be made from fisheries monitoring associated with pile driving construction activities. The number of adult equivalents potentially impacted during pile driving will be estimated from fisheries monitoring (i.e., snorkel counts) pre- and post- project. This list is meant to provide permitting agencies with preliminary information regarding potential mitigation sites that could be within the Mad River watershed.

The sites presented here represent a range of mitigation opportunities within the watershed. However, not all sites have been completely evaluated and fish passage mitigation opportunities have not been completely quantified (i.e., quantity of potentially spawning habitat available at each potential site). Caltrans will continue to consult with the fisheries resource agencies to determine the benefits of providing fish passage at each of the sites below. In addition, it may be necessary for Caltrans to consult with their water resources engineers in order to provide cost estimates of providing passage at each site (i.e., state culvert repairs).

2 -MRB Fisheries Mitigation

Potential fisheries mitigation sites are as follows:

1. Hall Creek (near Mad River confluence)

Hall Creek is a second order tributary to the Mad River. It flows into the Mad River south of the town of Blue Lake. Passage through a State culvert under HWY 299 provides anadromous salmonids with access to spawning and rearing habitat within Hall, Noisy, and Mill creeks. Hall and Noisy creeks have been identified as key coho salmon habitats to improve and maintain within California (CDFG 2004). The presence of coho salmon has not been confirmed in Mill Creek, however the creek has only been surveyed for juvenile presence during the summer months when the creek is dry. It may provide spring or winter rearing, or adult spawning habitat for salmonids.

State highway 299 crosses Hall Creek below its confluence with Noisy Creek (note: the creek which HWY 299 passes over is mislabeled on USGS maps as Noisy Creek). Juvenile coho salmon were documented utilizing Hall Creek in a California Department of Fish and Game 2001 coho salmon presence/absence survey of the Mad River watershed (Michelle Gilroy, CDFG, Personal Communication 2007).

Since coho salmon are present within Noisy and Hall creeks it is likely that the culvert near the confluence with the Mad River is a complete barrier to adult fish passage. However, it is not passable over a wide enough range of flows to facilitate complete utilization throughout the spawning season, and may be a complete barrier to juvenile salmonids attempting to move upstream to seek refuge from winter flows in the mainstem of the Mad River.

2. Mill Creek (at the Turner Road crossing in McKinleyville)

Mill Creek near McKinleyville is a first order tributary to the Mad River. The status of salmonid populations in Mill Creek near McKinleyville is not known at this time. However, it is believed to be an adult salmonid passage impediment. Potential repairs could include the installation of weirs but, may require a complete culvert replacement. No cost estimates are available at this time. Further consultation with Humboldt County Public Works, CDFG, and the National Marine Fisheries Service (NMFS) will be necessary to determine what benefit passage mitigation at this site would provide to Mad River salmonids.

3. Essex Gulch (Highway 299 crossing)

Essex Gulch, is a perennial stream that should support coho, steelhead and coastal cutthroat trout. However, it was not listed in the *Recover Strategy for California Coho Salmon* (CDFG 2004). The Caltrans facility in a 2001 survey was estimated

3 -MRB Fisheries Mitigation

to be in good condition (and is therefore unlikely to be funded as a facilities maintenance or replacement project anytime in the near future).

The Caltrans structure is 605' long and has a slope of 2.1%. It reportedly meets adult fish passage guidelines for 44% of fish passage design flows (Lange 2001). The culvert is likely an upstream passage barrier to juveniles for most, if not all flows. There is approximately 6,000 feet of usable, albeit somewhat degraded, habitat available upstream.

A shorter, and less deeply buried, county culvert is located approx 100 feet downstream of the state culvert; the county culvert appears to be a complete barrier due to an excessive outlet perch (greater than 6 feet). Chris Whitworth (Humboldt County Public Works) has stated that the Caltrans facility mentioned above is viewed as a barrier to fish passage and therefore the County has not actively sought funding to repair its culvert, which is located just downstream of the State culvert. A proposed fix of fish passage of the Caltrans Essex Gulch facility would require that the County culvert also be fixed. It may be necessary to re-evaluate adult fish passage criteria at both of these culverts to determine potential approaches to mitigation.

4. Mill Creek (NF Mad River)

Mill Creek is a tributary to the NF of the Mad River. CDFG surveys in 2005 documented the presence of juvenile rainbow trout (potentially steelhead, or coastal cutthroat trout). There are two high flow culvert barriers located approximately 250 ft and 500 ft from the Mill Creek and Mad River confluence. No cost estimates are available at this time. Further consultation with Humboldt County Public Works, CDFG, and NMFS will be necessary to determine what benefit passage mitigation at this site would provide to Mad River salmonids. Note: the location of this potential mitigation site is not on the enclosed map. Its exact location needs to be verified in the field.

5. Powers Creek (HWY 299 Crossing)

Powers Creek is listed as a historic coho salmon stream. The state culvert, located at the HWY 299 crossing, may be a passage barrier. Channel slopes above the culvert are believed to be too steep for anadromy. If the habitat above the culvert is suitable for anadromous salmonids (i.e., not too steep) then the culvert would need to be completely replaced (Lang 2001). Dan Free (NMFS, personal communication to Kelley Garrett, 2007) believes this facility to be a good candidate for a fish passage improvement.

6. Mad River Hatchery Dam Weir (below the Mad River Hatchery)

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4 -MRB Fisheries Mitigation

There has been some discussion with CDFG and NMFS about repairing the weir to facilitate adult and juvenile passage. Improving fish passage at the weir may benefit the Mad River summer steelhead population in particular. No cost estimates are available at this time. Further consultation with CDFG, and NMFS will be necessary to determine what benefit passage mitigation at this site would provide to Mad River salmonids.

References

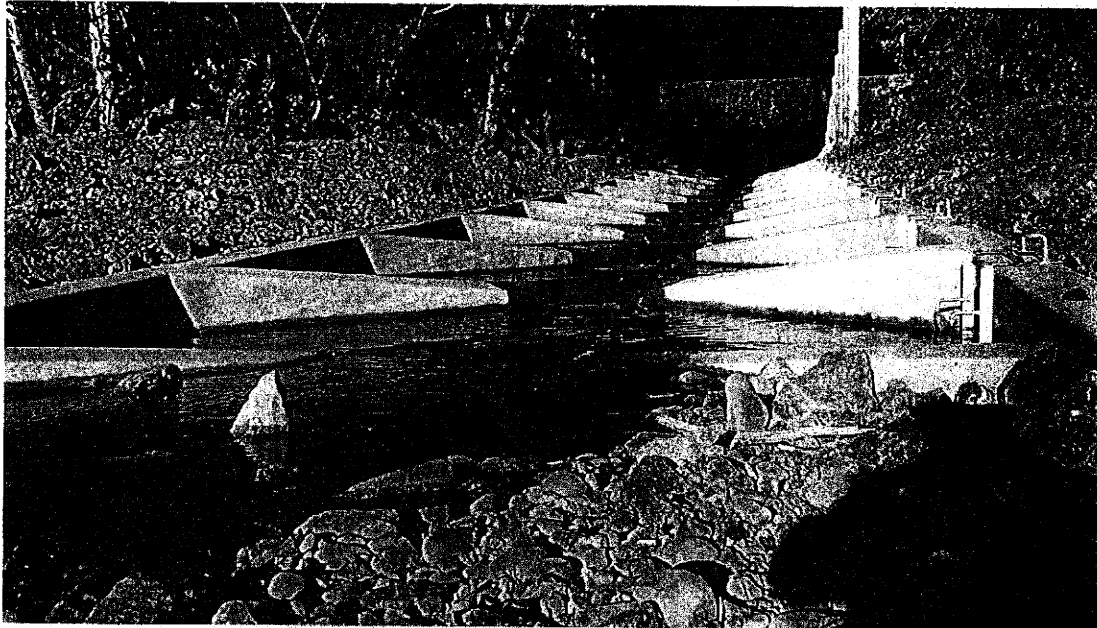
CDFG 2004. Recovery Strategy for California Coho Salmon, A Report to the California Fish and Game Commission.

Lange, M. 2001. California Department of Transportation (Caltrans) District 1 Pilot Fish Passage Assessment Study: Humboldt County Fish Passage Studies.

Enclosures

Mad River Bridges Replacement Project Potential Fisheries Mitigation Sites (Map)

4 of 4

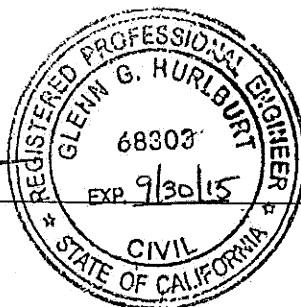


Hall Creek Mad River Fish Passage Mitigation Final Report

This report has been prepared under the direction of the following Registered Civil Engineer (Engineer). The Engineer attests to the technical information contained herein and the engineering data upon which recommendations, conclusions, and decisions are based.

Signature on File

Glenn G. Hurlburt, PE
Registered Civil Engineer



12/23/2013
DATE

EXHIBIT NO. 5

APPLICATION NO.

1-07-013-A3 - CALTRANS
HALL CREEK FISH
PASSAGE REPORT (1 of 26)

This project was initiated as mitigation for the Mad River Bridge Replacement project on Route 101 at PM 89.1/90.4, EA 296101. The fish passage mitigation site is located at the confluence of Hall Creek and the Mad River (See Attachment A, Vicinity Map), and was identified by the California Department of Fish and Game as a barrier to juvenile salmonids and a partial barrier to adult salmonids. Listed under 2008 DFG Restoration Grant Program #723006, the barrier consists of an approximately 7 foot drop through one ton RSP. Removal of the barrier will provide access to approximately 4.0 miles of upstream habitat.



Figure 1: 7 foot RSP barrier at confluence Hall Creek and the Mad River. Flows at this location are sub-surface during late summer months

Development of Design

The target species for design of the fish passage structure was both juvenile and adult Coho and Steelhead salmon. Constraints for the Hall Creek fish passage design include keeping the project footprint within existing Caltrans Right of Way (R/W), cost, work windows, permit requirements, and working with adjacent landowners. As the proposed barrier is located at an existing highway structure, an additional constraint is that there is no change to stream stability that may negatively affect scour potential at the structure. Scour potential is assessed in accordance with FHWA technical advisory report "Evaluating Scour at Bridges" and within Caltrans Structure Guidelines. Scour counter measures installed at this location included rock slope protection on both banks of Hall Creek and a cable-tied check dam consisting of large boulders, installed at the time of bridge structure construction (1965). Past bridge inspections indicate no deficiencies of any significance since construction. Channel cross sections since 1972 confirm this

stability. The bridge will remain stable for scour conditions as long as properly designed counter measures remain in place. This situation precluded the use of the Roughened Channel Design strategy due to the potential of scour at high flows.

Fish passage flows for the different life stages of salmonid species were determined in accordance with the *National Marine Fisheries Guidelines for Salmonid Passage at Stream Crossings*. Of the three design methods, (Active Channel, Stream Simulation, Hydraulic Design), Hydraulic design was chosen due to characteristics of the existing barrier and close proximity of the Route 299 Mill Creek overcrossing. Calculated flows included high and low flows for adult and juvenile anadromous salmon, as well as resident trout species. Flows were determined using a Basin Transfer Method with Bull Creek USGS Station Number 11476600, as described in *Improving Stream Crossings for Fish Passage* Final Report, April 2004, National Marine Fisheries Service Contract No. 50ABNF800082, and can be seen in Attachment C (Flow Duration Summary for Hall Creek, Hum-299-PM 4.2).

A fish way similar to the Peacock Creek pool and weir fish way in Del Norte county was designed and reviewed by National Marine Fisheries personnel to address the approximately 7 foot drop at the confluence of Hall Creek and the Mad River. Due to limited area between Route 299 and the Mad River Floodplain it was determined that a fish way approximately 15 foot wide and 90 feet long, with an 8 inch drop between weirs would be used for the design (See Attachment B, Asbuilt Plans). Water surface elevations were determined using HEC RAS software. Results can be seen in Attachment E (Water surface summary). Areas along the fish way would be excavated to the 2-yr water surface elevation (WSE) and replaced with engineered streambed material (ESM) in accordance with the guidance from the California Salmonid Habitat Restoration Manual (pg 67-72), and revegetated with local willow and cottonwood species.

Preliminary construction costs were estimated at \$643,000. A temporary construction easement was also necessary to access the site.

Hydrology and Floodplain

Hall Creek at this location drains approximately 2560 Acres (4 sq mi). The drainage area consists mainly of moderate slopes of cut over timberland (see Attachment A, Vicinity Map). Average yearly rainfall for this area of Humboldt County is 49 in/yr. Storm flows for Hall Creek can be seen in Attachment C (Flow Duration Summary for Hall Creek Hum-299-PM R4.2).

Hall Creek flows subsurface at the confluence with the Mad River during summer months. This condition usually results in juvenile salmonids being stranded in a pool at the base of the barrier thus being susceptible to predation. Most years flows will not connect with the main stem of the Mad River until the first storms of the fall season.

This section of Hall Creek is within an area defined by the Federal Emergency Management Agency (FEMA) as Zone A (see Attachment D, Floodplain Evaluation Report Summary (FERS)), areas subject to inundation by the 1-percent-annual-chance flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. The FERS was completed and approved on October 26, 2011, and indicates the project will not have a significant effect on the base floodplain. Due to its proximity to the Mad River Flood Plain, the project site can be backwatered several times a year under normal winter conditions.

Storm Water

Exit velocities at the outlet will be decreased with the placement of the new fish way. The only impacts are those that will occur during construction operations. Impacts will be mitigated by utilization of Best Management Practices for water pollution control. A Storm Water Data Report was prepared for the project.

Construction

The project was advertised by Caltrans in July of 2012, and awarded to Desert Concepts INC. of Palm Desert, CA in the amount of \$440,910. The following shows items and bid amounts for the fish way.

Table 1: Project Costs

Description	Unit	Quantity	Bid	Amount
Temporary Fence	LF	200	\$12.00	\$2,400.00
Construction Management	*LS	1	\$5000.00	\$5,000.00
Water Pollution Control Plan	LS	1	\$800.00	\$800.00
Temp. Creek Diversion	LS	1	\$122,000.00	\$122,000.00
Temp. Straw Bale Barrier	LF	25	\$20.00	\$500.00
Temp. Concrete Washout	LS	1	\$2,500.00	\$2,500.00
Construction Area Signs	LS	1	\$3,000.00	\$3,000.00
Fish Protection	LS	1	\$6,000.00	\$6,000.00
Reset Rock Slope Protection	CY	300	\$100.00	\$30,000.00
Roadway Excavation	CY	80	\$100.00	\$8,000.00
Class 2 Aggregate Base	CY	80	\$60.00	\$4,800.00
Minor Concrete (Fish Way)	CY	200	\$850.00	\$170,000.00
Rock Slope Protection (1ton)	CY	200	\$88.00	\$17,600.00
Cable Railing	LF	90	\$120.00	\$10,800.00
Mobilization	LS	1	\$57,510.00	\$57,510.00
*LS – Lump Sum			Total	\$440,910.00

California Department of Fish and Wildlife personnel electro-fished the project site in summer 2012 before construction activities proceeded. Fish relocation numbers are shown in Table 2.



Figure 2: Electro-fishing hole at toe of RSP barrier

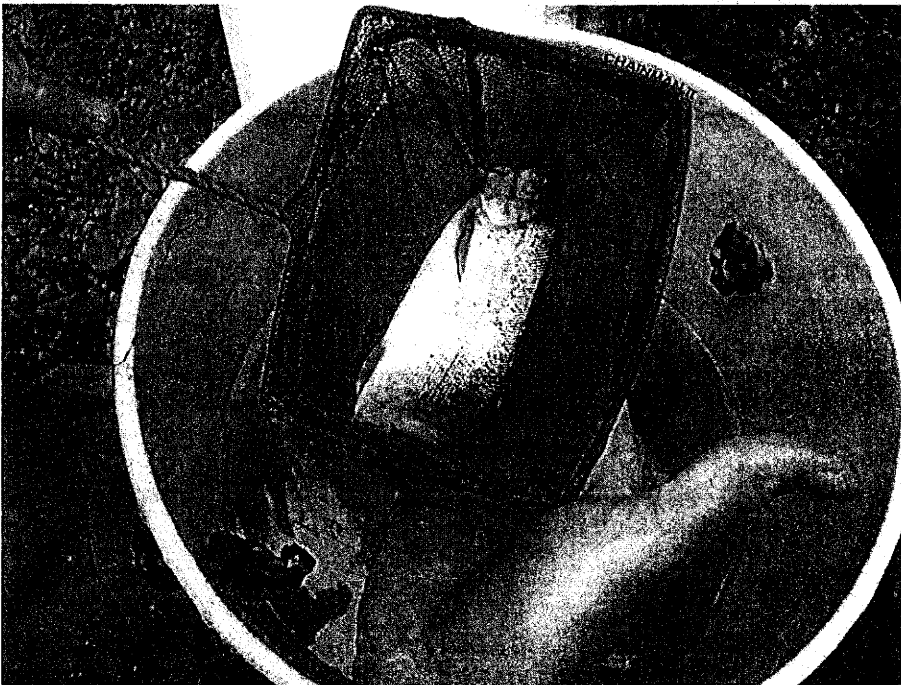


Figure 3: Coastal Cutthroat

Table 2: Fish relocation summary summer 2012

Common Name	Scientific Name	7/26/12	8/31/12	9/6/12	9/7/12	Total
Steelhead	Oncorhynchus mykiss	200	20	9	20	249
Coho	Oncorhynchus kisutch	128	14	3	7	152
Cutthroat Trout	Oncorhynchus clarki	4	0	0	0	4
Western Brook Lamprey	Lampetra richardsoni	14	2	0	13	29
Three-spined Stickleback	Gasterosteus aculeatus	1,000+/-	122+/-	43+/-	*	1165+/-
Prickly Sculpin	Cottus asper	21	6	1	37	65
Mortalities	(o. mykiss)		1	0	2	3

*Number of Stickleback were not recorded

Construction began in September of 2012 and included the following:

- Temporary clear water diversion
- Removal of existing RSP barrier
- Placing compacted subbase for fish way
- Forming and placing rebar for floor, walls, and weirs
- Pouring concrete floor
- Pouring concrete walls and weirs 1 and 2
- Placing material in fish way for access to sides
- Placing Engineered Streambed Material (ESM) on sides of fish way
- Planting
- Removing material from fish way and pouring remaining concrete weirs
- Placing remaining ESM along sides of fish way
- Constructing rock weir at outlet
- Removal of excess material from job site
- Cleanup

The project was 90% completed by October 15, 2012 at which time the contract was placed into winter suspension due to high flows in Hall Creek.

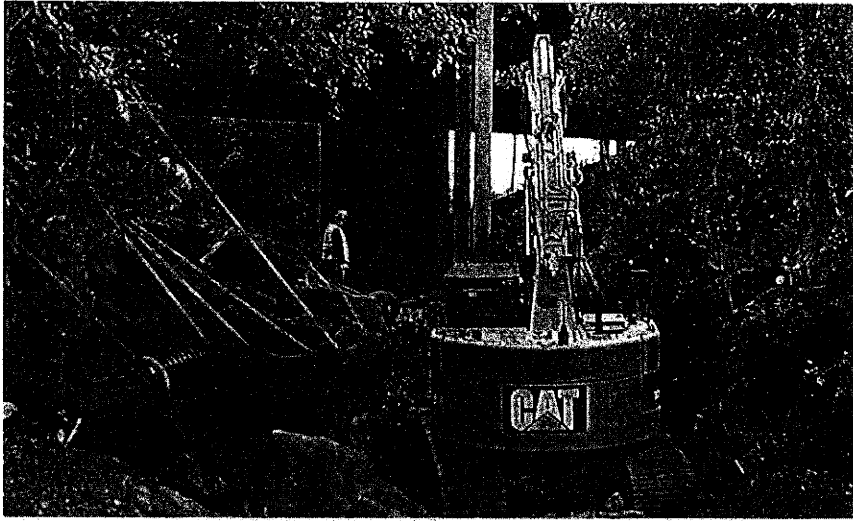


Figure 3: RSP removal and clear water diversion.

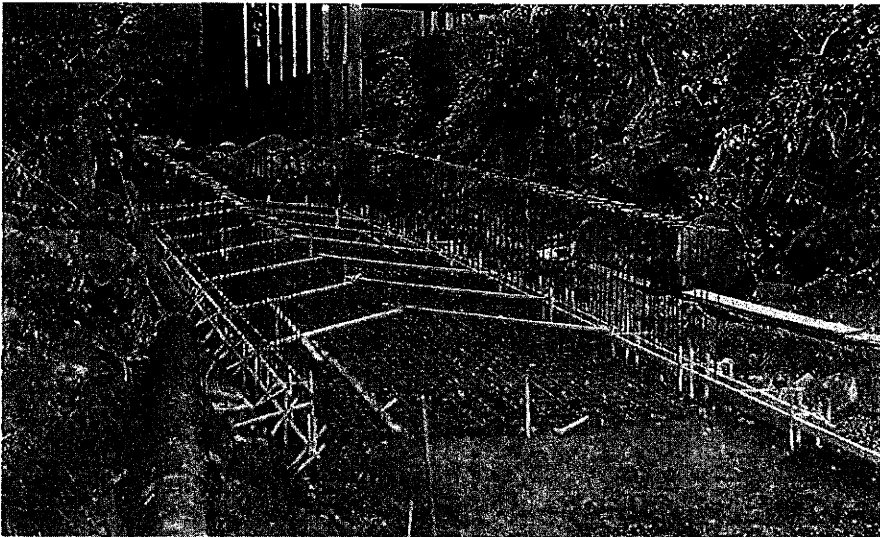


Figure 4: Forming and setting rebar for fish way.

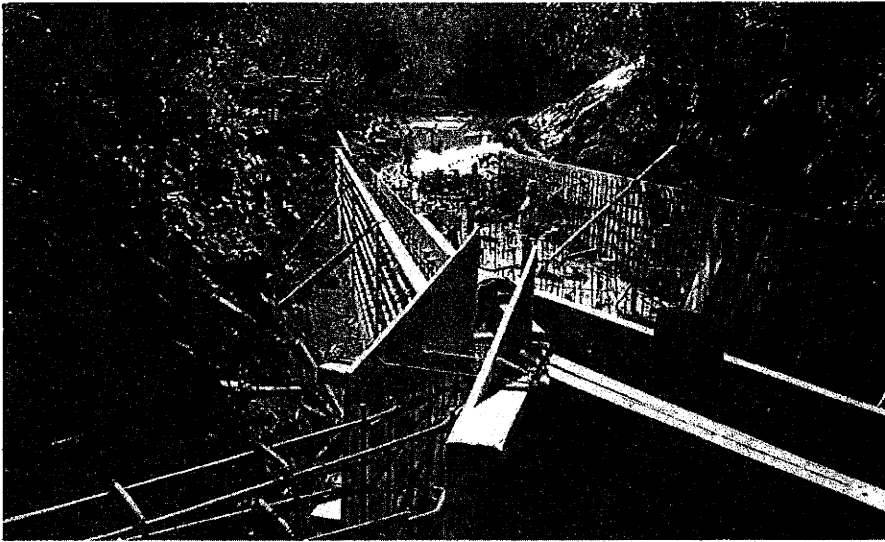


Figure 5: Forming and setting rebar for fish way.



Figure 6: Fish way completed, juvenile salmonids observed progressing up fish way by Caltrans and Fish and Wildlife personnel.

Planting alongside of fish way included approximately 150 willow cuttings, 16 cotton wood cuttings, and 31 alder seedlings.

After winter storms of 2012/2013, reviews by National Marine Fisheries Service and California Department of Fish and Wildlife personnel determined the fish way should be extended an additional 18ft to compensate for a 1ft drop in elevation at the outlet, and preliminary design of a fish way extension in case of Mad River perching the outlet of the fish way in the future.

Remaining work included:

- Removal of rock weir
- Extending fish way two bays
- Placing access ladders into each of the bays
- Modifying weir 8 to provide 8" drop between weirs
- Placing additional ESM alongside and in front of fish way
- Placing rock clusters upstream of the fish way to provide stream diversity
- Additional planting

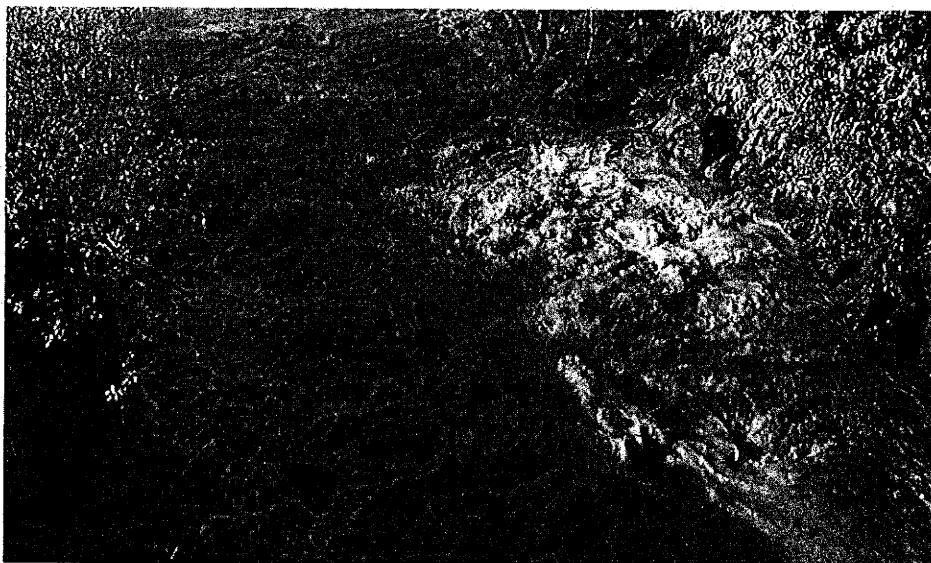


Figure 7: High water flows December 2012, fish way totally submerged, backwatered by the Mad River approximately 1/3 of the way up fish way. Mad River flows were determined to be a 4 year storm event.

Construction 2013

Desert Concepts INC returned in August of 2013 and was awarded an additional \$107,000 for the work required for extending the fish way. Before dewatering, the project site was electro-fished by personnel from Department of Fish and Wildlife. Relocation numbers are shown in Table 3.

Table 3: Fish relocation summary summer 2013

Common Name	Scientific Name	7/24/13	7/25/13	Total	Mortalities refishing	Mortalities stranded
Steelhead	Oncorhynchus mykiss	124	2	126	2	3
Coho	Oncorhynchus kisutch	44	229	273	4	3
Cutthroat	Oncorhynchus clarki	1	2	3	0	0
Lamprey Brook	Lampetra sp	4	9	13	0	2
Pacific Lamprey	Lampetra tridentata	2	0	2	0	0
Stickleback	Gasterosteus aculeatus	62	72	134	2	4
Sculpin	Cottus sp	9	76	85	3	1
Pacific Giant Salamander	Dicamptodon tenebrosus	0	4	4	0	0

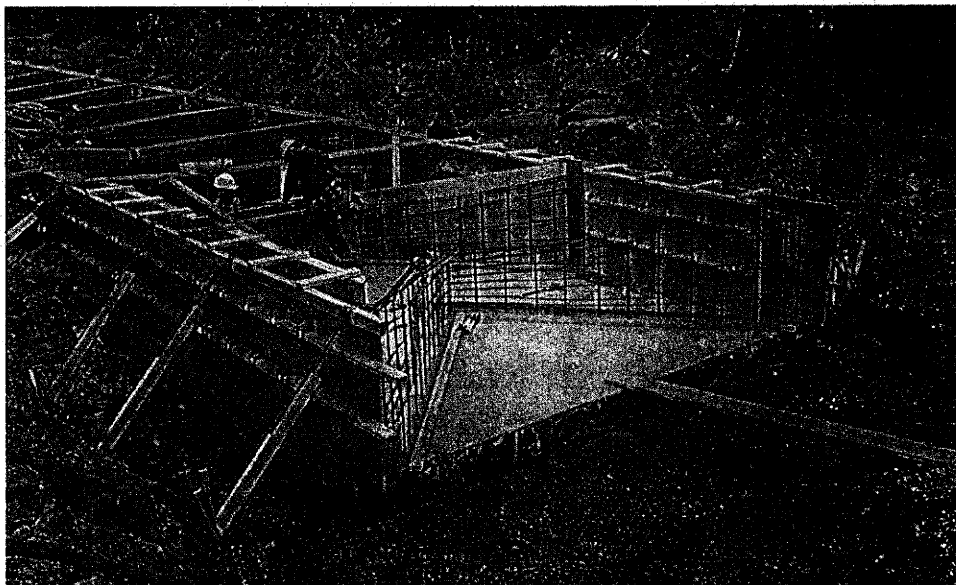


Figure 8: Downstream ladder extension under construction, August 2013.

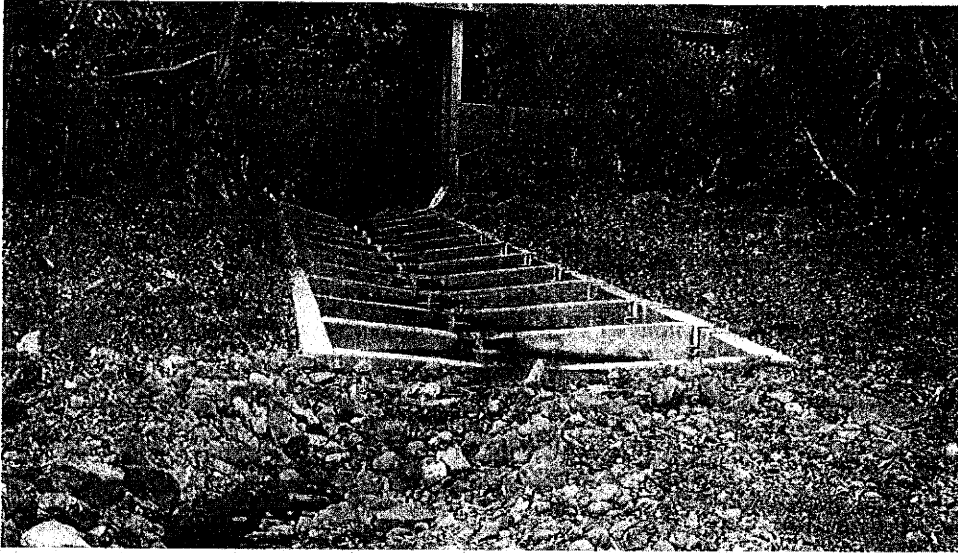


Figure 9: Completed Fish Way September 2013.

Final contract acceptance was completed on September 10, 2013.

Post Construction Commitments

As per Lake or Streambed Alteration Notification No. 1600-2011-0296-R1 Mad River Fish Passage Mitigation project, Humboldt County (signed and dated September 17, 2012), permittee (Caltrans) shall comply with following conditions;

The Permittee shall maintain stream channel and the Fish Way structure and associated fill each year as needed for as long as the structure remains in the stream. If rock slope protection (RSP), rock clusters, stream banks, the stream channel, structure, or fill experiences any erosion, damage or failure, the Permittee shall consult with the Department to apply minor adaptive management strategies such as including rip-rap bands within the engineered fill or adding small "wing walls" at the base of the Fish Way.

The Permittee shall monitor flow velocity and jump heights across several of the weirs for the first two years after installation. Monitoring shall occur at least 6 times between March and November over a range of flows between 1cfs and 10% exceedence flow. If monitoring shows the structure as designed fails to pass fish, the Permittee shall consult with the Department and NMFS to employ adaptive management strategies (e.g rip-rap bands within the engineered fill or adding small "wing walls" at the base of the Fish Way).

The initial monitoring of flows and velocities was completed on December 3, 2013. Results and photos can be seen in Attachment G (Flow Monitoring).

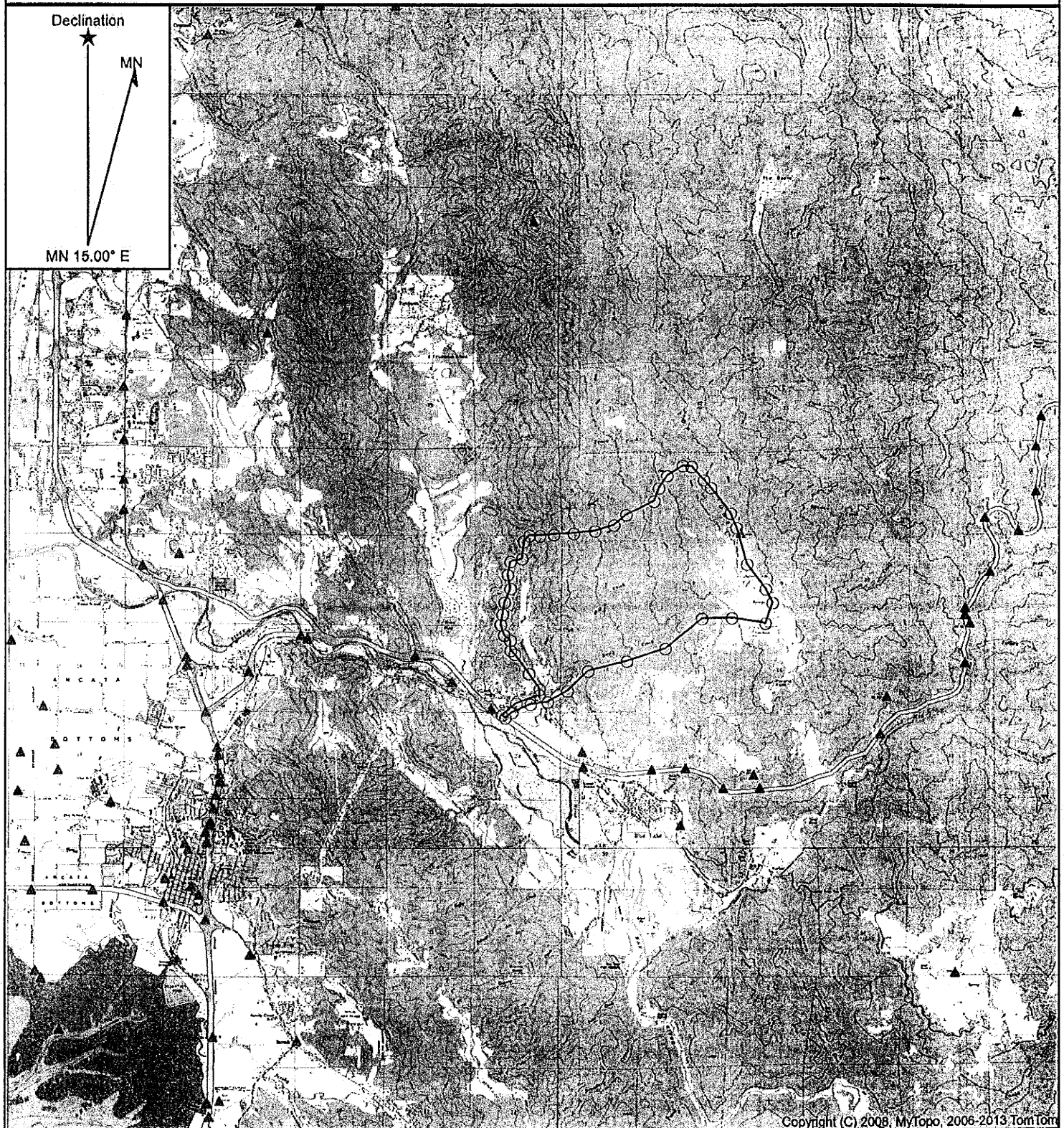
Project Personnel

Glenn Hurlburt, PE - Caltrans, Project Engineer
Susan Leroy - Caltrans, Environmental Coordinator
Katie Thoreson - Caltrans, Environmental Biologist
Gary Johnson, PE - Caltrans, Construction Manager
Richard Mullen, PE - Caltrans, Project Manager
Gary Flosi - California Department of Fish and Wildlife, Grant Coordinator
Scott Bauer - California Department of Fish and Wildlife, Project Coordinator
Jo Ann Dunn - California Department of Fish and Wildlife, Project Oversight
Margaret Tauzer - National Marine Fisheries Service, Hydraulic Engineer Oversight
Julio Castro - Desert Concepts, INC, President

Attachments:

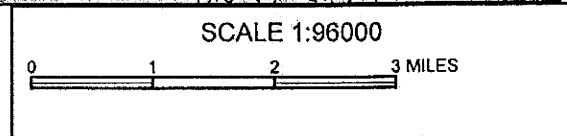
- A. Vicinity Map
- B. As-built Plans
- C. Flow Duration Summary for Hall Creek
- D. FERS
- E. HEC RAS - Water Surface Summary
- F. Fish Passage Flows
- G. Flow monitoring

Vicinity Map



Name: ARCATA NORTH
Date: 12/05/13
Scale: 1 inch = 8,000 ft.

13 of 26



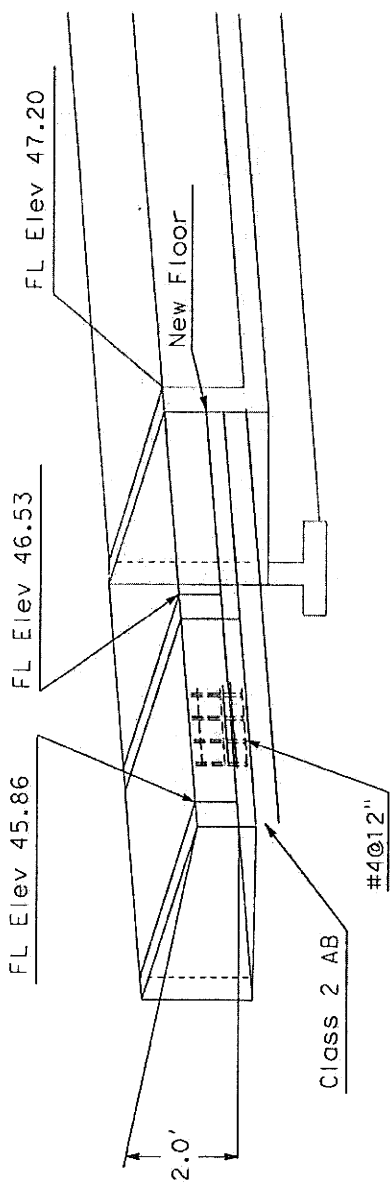
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2/5

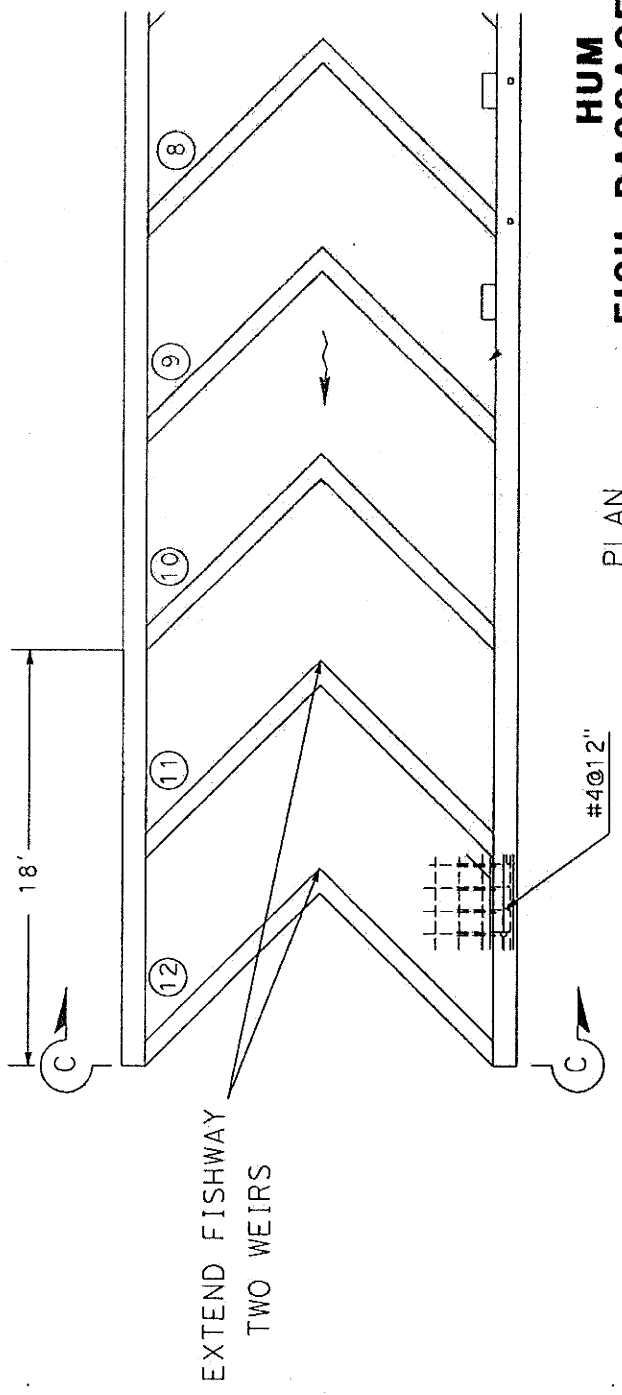
DATE	COUNTY	ROUTE	POST MILES	TOTAL PROJECT	SHEET TOTAL
01	Hum	299		R4.2	

REGISTERED CIVIL ENGINEER
 GLENN G. JAMES
 No. 55303
 State of California
 EXPIRATION DATE 12/31/17

PLANS APPROVAL DATE _____ DATE _____
 FOR STATE OF CALIFORNIA ON ITS OFFICERS
 OR AGENTS SHALL NOT BE RESPONSIBLE FOR
 CONSEQUENCES OF THIS PLAN SHEET.



SECTION C-C



PLAN

WEIR NUMBER	FL ELEVATION
1	53.24
2	52.57
3	51.91
4	51.22
5	50.58
6	49.90
7	49.22
8	48.45
9	47.88
10	47.20
11	46.53
12	45.86

ASBUILTS
CCO #1
01-296124
HUM 299 PM R4.2
FISH PASSAGE MITIGATION

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	FUNCTIONAL SUPERVISOR	CHECKED BY	DATE REVISSED
REVISOR	DESIGNED BY	DATE REVISSED	

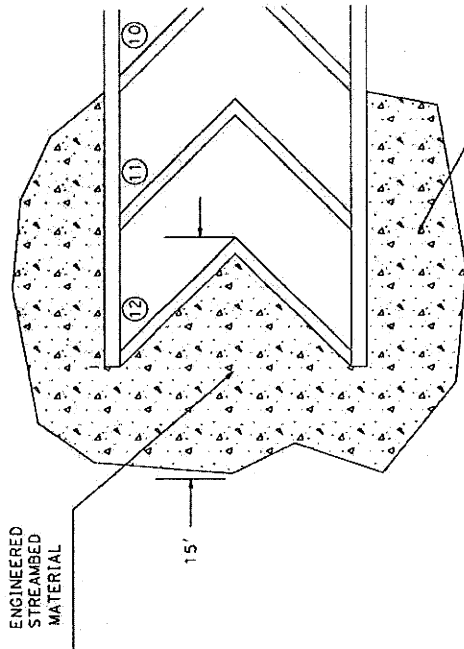
3/5

DATE	COUNTY	ROUTE	POST MILES	SHEET NO.	TOTAL SHEETS
9/1	HUM	299	R4.2		

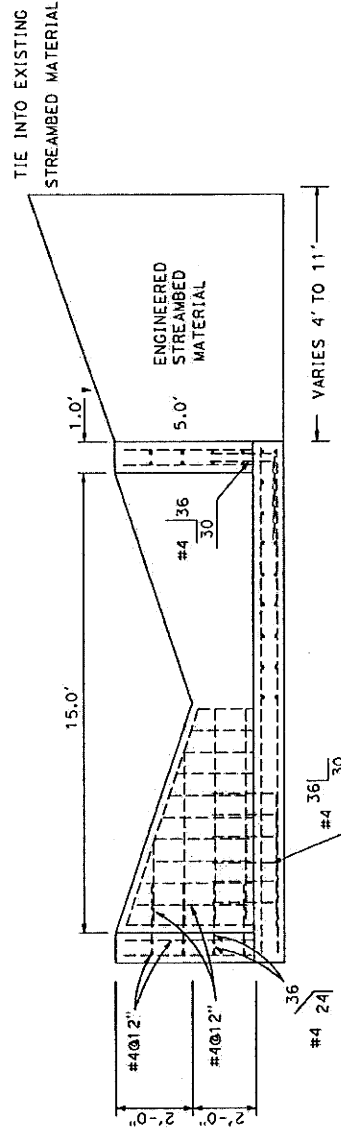
REGISTERED CIVIL ENGINEER
 J. L. HALL
 No. 63303
 Exp. 12/31/11

PLANS APPROVAL DATE: 2/27/12
 RECORDING CIVIL ENGINEER: J. L. HALL
 No. 63303
 Exp. 12/31/11

THE STATE OF CALIFORNIA, BY ITS OFFICER OF HIGHWAYS, HAS REVIEWED THIS PLAN SHEET FOR CONFORMANCE WITH THE REQUIREMENTS OF THE CALIFORNIA HIGHWAY PRACTICE ACT.



PLAN



TYPICAL

ASBUILTS
CCO #1
01-296124
HUM 299 PM R4.2
FISH PASSAGE MITIGATION

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	FUNCTIONAL SUPERVISOR	CHECKED BY	DESIGNED BY	DATE	REVISIONS

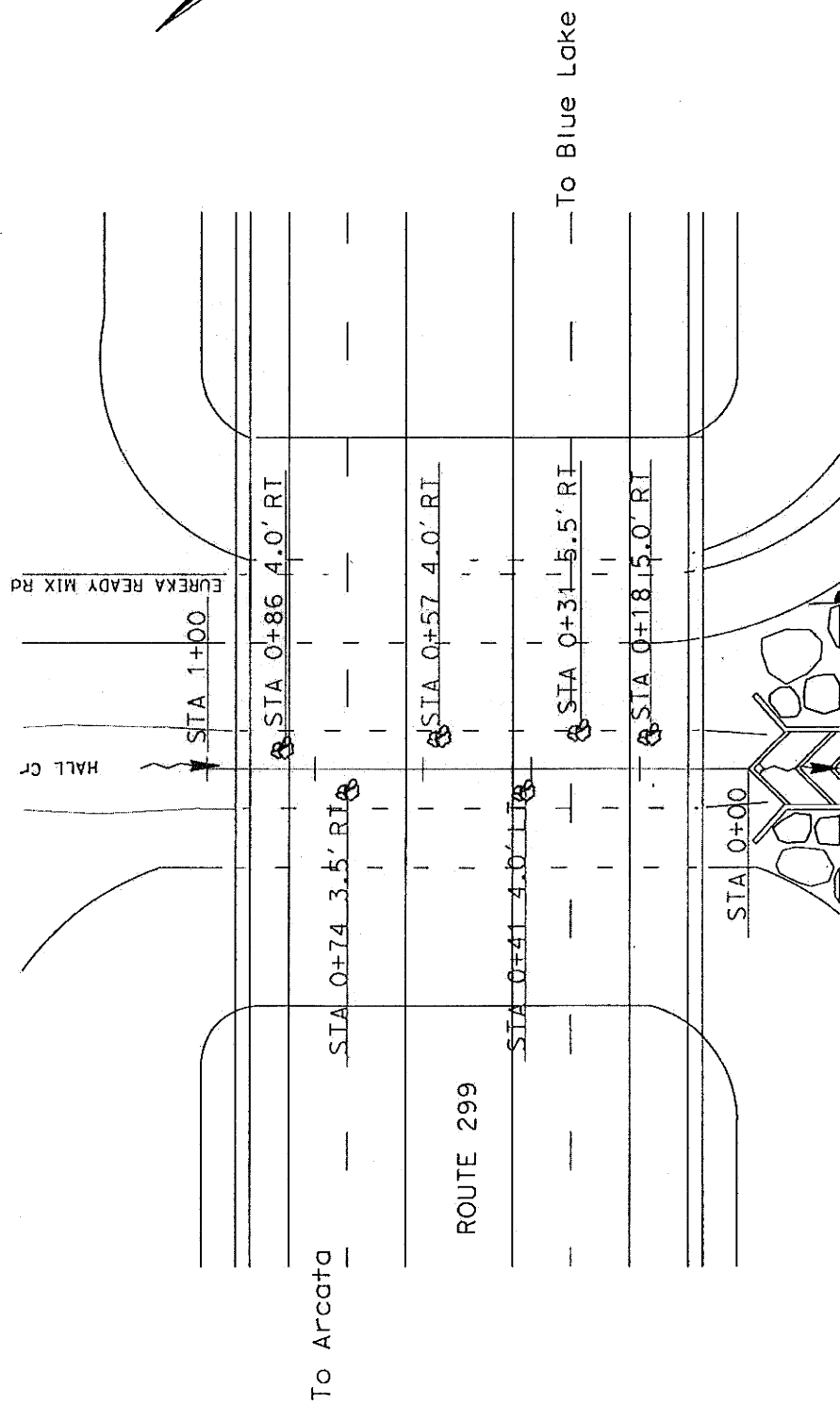
BORDER LAST REVISED 7/2/2010

Revised Plan 2_8_12.dgn 12/6/2013 1:47:59 PM

4/5

Dist	County	Route	Post Miles	Total Project	Sheet	Total
01	Hum	299	R4.2			

REGISTERED CIVIL ENGINEER
 DATE 12-21-12
 PROJECT NO. 01-256/24
 SHEET NO. 4/5
 PROJECT NAME GLENN HURD/DUCT



STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	FUNCTIONAL SUPERVISOR	CALCULATED BY	CHECKED BY	DATE REVISD	REVISD BY

AS BUILT
 CONTRACT NO. 01-256/24
 C.C.A. DATE 10/20/2013
 P.E. NAME GLENN HURD/DUCT

PLAN
 ROCK CLUSTERS

18 of 26

19 of 26

FLOODPLAIN EVALUATION REPORT SUMMARY

Dist. 01 Co. Hum Rte. 299 P.M. 4.2
 Project No.: 01-296121 Bridge No.

Limits: The project proposes to eliminate a fish passage barrier by construction of a Fish-Way approximately 15' wide and 70' long at the confluence of Hall Creek with the Mad River on Route 299 at PM 4.2. The proposed Fish-way will have a maximum water surface elevation differential of six inches, and will provide access to 1 mile of upstream habitat

Floodplain Description: The project site is located on FEMA map 0600600620C. This section of Hall Creek is within an area defined by the Federal Emergency Management Agency (FEMA) as Zone A (see firmette), areas subject to inundation by the 1-percent-annual-chance flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. The proposed work at the confluence will increase the water surface elevation in the channel by less than 1 ft. This will enhance fish passage, but will not affect any upstream property owners in regards to flooding.

- | | No | Yes |
|---|---------------|---------------|
| 1. Is the proposed action a longitudinal encroachment of the base floodplain? | <u> </u> | <u> x </u> |
| 2. Are the risks associated with the implementation of the proposed action significant? | <u> x </u> | <u> </u> |
| 3. Will the proposed action support probable incompatible floodplain development? | <u> x </u> | <u> </u> |
| 4. Are there any significant impacts on natural and beneficial floodplain values? | <u> x </u> | <u> </u> |
| 5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain. | <u> x </u> | <u> </u> |
| 6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q). | <u> x </u> | <u> </u> |
| 7. Are Floodplain Hydraulic Studies that document the above answers on file? If not explain. | <u> </u> | <u> x </u> |

PREPARED BY:

Signature on File

Signature - Dist. Hydraulic Engineer

Date

10/26/11

Signature on File

Signature - Dist. Environmental Branch Chief

Date

10/26/2011

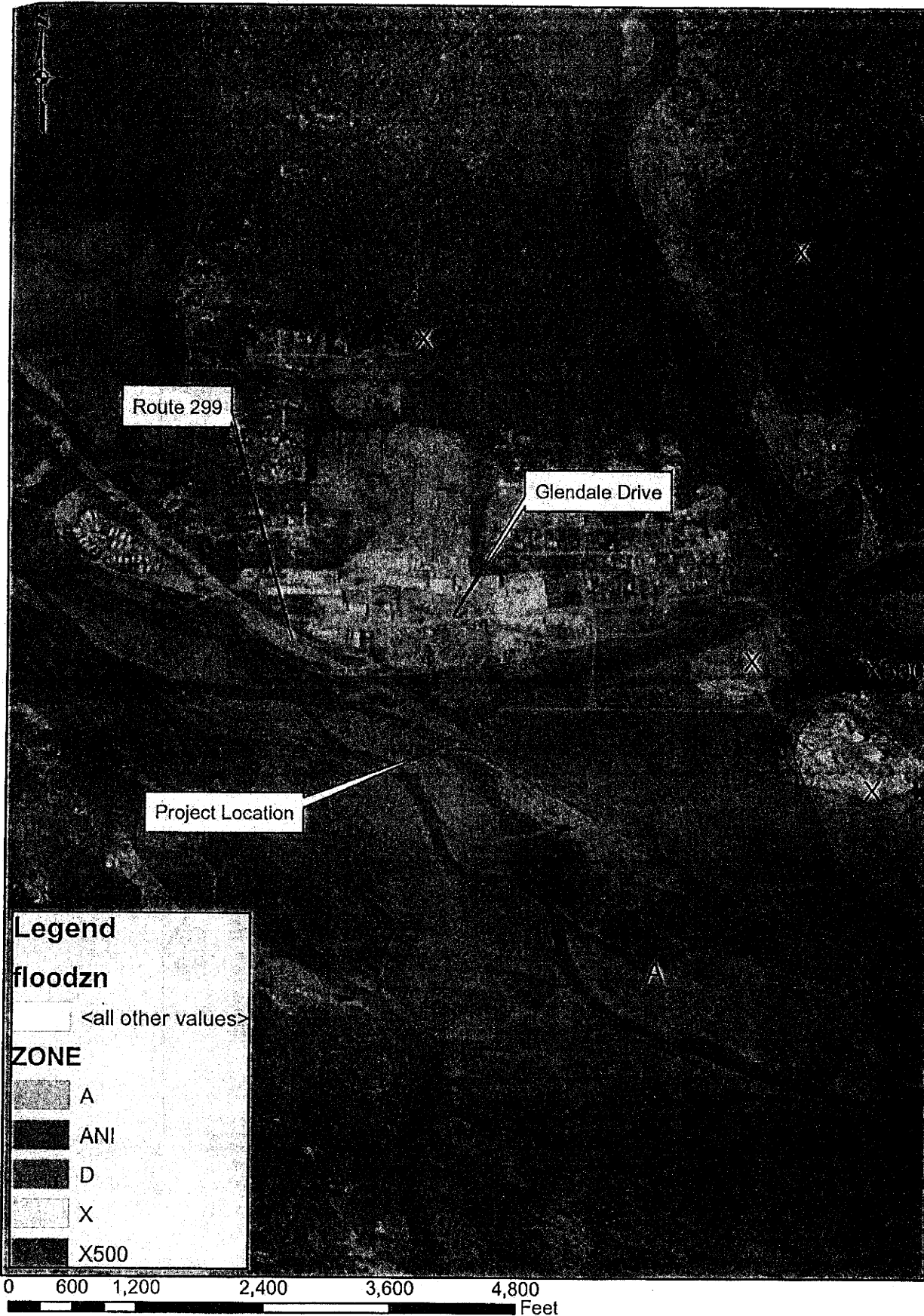
Signature on File

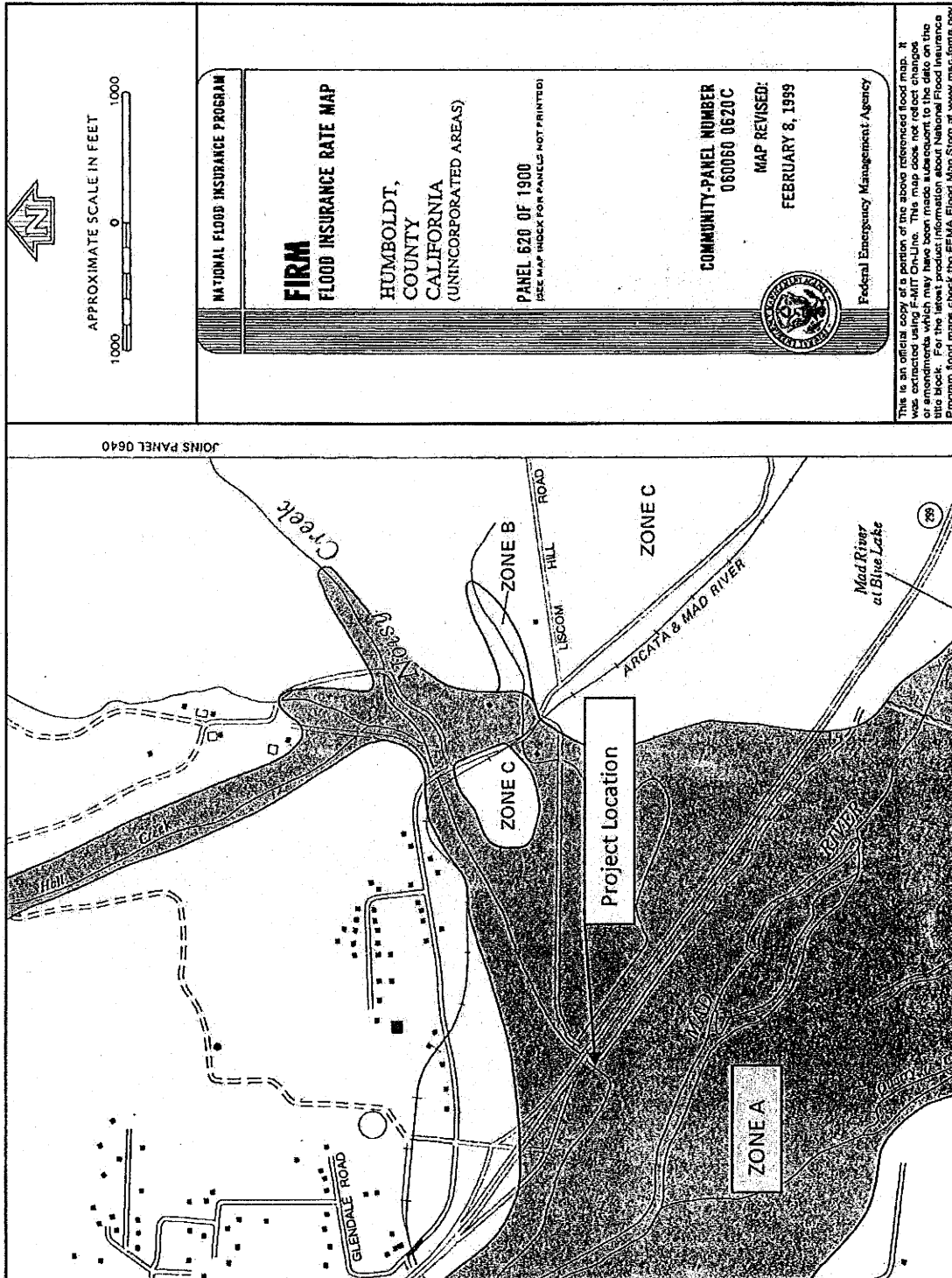
Signature - Dist. Project Engineer

Date

10/26/11

Vicinity Map





Reach	River Sta	Profile	Q Total (G/S)	Min Chl El (ft)	W/S Elev (ft)	Cut W/S (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Friction # Chl
Hall	1100	Q2	374	52.8	56.39	55.44	56.93	0.008895	5.88	63.57	21.63	0.6
Hall	1100	Juv Low	1	52.8	52.95	52.94	52.97	0.035542	1.13	0.89	11.54	0.72
Hall	1100	Juv High	32	52.8	53.63	53.42	53.75	0.012286	2.82	11.34	16.23	0.59
Hall	1100	Res Low	2	52.8	53.01	52.98	53.03	0.025433	1.21	1.65	15.02	0.64
Hall	1100	Res High	55	52.8	53.98	53.64	54.14	0.009932	3.21	17.12	16.91	0.56
Hall	1100	Adlt Low	3	52.8	53.06	53	53.09	0.015324	1.22	2.47	15.13	0.53
Hall	1100	Adlt High	133	52.8	54.84	54.21	55.1	0.008168	4.1	32.45	18.6	0.55
Hall	1100	Max EDF	70	52.8	54.18	53.76	54.36	0.009222	3.42	20.48	17.3	0.55
Hall	1087	Q2	374	52.54	56.34		56.81	0.007259	5.48	68.22	22.04	0.55
Hall	1087	Juv Low	1	52.54	52.73		52.74	0.011756	0.74	1.34	14.2	0.43
Hall	1087	Juv High	32	52.54	53.57		53.64	0.005511	2.19	14.62	16.62	0.41
Hall	1087	Res Low	2	52.54	52.76		52.78	0.018409	1.1	1.82	15.04	0.55
Hall	1087	Res High	55	52.54	53.93		54.04	0.005521	2.66	20.68	17.32	0.43
Hall	1087	Adlt Low	3	52.54	52.76		52.8	0.039667	1.62	1.85	15.05	0.82
Hall	1087	Adlt High	133	52.54	54.8		55	0.005726	3.64	36.53	19.03	0.46
Hall	1087	Max EDF	70	52.54	54.13		54.26	0.005531	2.9	24.18	17.71	0.44
Hall	1075	Q2	374	52.3	56.3		56.71	0.006062	5.15	72.65	22.43	0.5
Hall	1075	Juv Low	1	52.3	52.44	52.44	52.47	0.054833	1.32	0.75	10.64	0.88
Hall	1075	Juv High	32	52.3	53.54		53.59	0.002777	1.76	18.2	17.04	0.3
Hall	1075	Res Low	2	52.3	52.51		52.53	0.02357	1.18	1.69	15.03	0.62
Hall	1075	Res High	55	52.3	53.9		53.98	0.00333	2.26	24.38	17.73	0.34
Hall	1075	Adlt Low	3	52.3	52.61		52.62	0.007031	0.96	3.12	15.21	0.37
Hall	1075	Adlt High	133	52.3	54.77		54.93	0.004199	3.28	40.54	19.43	0.4
Hall	1075	Max EDF	70	52.3	54.1		54.19	0.003556	2.51	27.94	18.12	0.36
Hall	1072	Q2	374	47.85	56.5	50.53	56.62	0.000075	2.82	149.92	27.09	0.17
Hall	1072	Juv Low	1	47.85	52.4	47.9	52.4	0	0.01	68.22	15	0
Hall	1072	Juv High	32	47.85	53.57	48.37	53.58	0.000002	0.37	85.86	15	0.03
Hall	1072	Res Low	2	47.85	52.53	47.93	52.53	0	0.03	70.16	15	0
Hall	1072	Res High	55	47.85	53.95	48.6	53.95	0.000005	0.6	91.52	15.73	0.04
Hall	1072	Adlt Low	3	47.85	52.62	47.95	52.62	0	0.04	71.51	15	0

Attachment E
Hec-Ras Water Surface Summary
Hall Creek Fish Passage
December 11, 2013

Hall	1072	Adlt High	133	47.85	54.87	49.19	54.89	0.00002	1.26	109.08	22.53	0.08
Hall	1072	Max EDF	70	47.85	54.16	48.72	54.17	0.000008	0.74	94.98	17.29	0.05
Hall	1070.5		Inl Struct									
Hall	1069	Q2	374	47.7	56.05		56.18	0.000085	2.94	141.8	26.3	0.18
Hall	1069	Juv Low	1	47.7	51.83		51.83	0	0.02	51.92	15	0
Hall	1069	Juv High	32	47.7	53.21		53.21	0.000002	0.39	82.63	15	0.03
Hall	1069	Res Low	2	47.7	51.97		51.97	0	0.03	64.05	15	0
Hall	1069	Res High	55	47.7	53.6		53.61	0.000006	0.62	88.56	15	0.05
Hall	1069	Adlt Low	3	47.7	52.08		52.08	0	0.05	65.64	15	0
Hall	1069	Adlt High	133	47.7	54.47		54.49	0.000022	1.31	103.71	20.69	0.09
Hall	1069	Max EDF	70	47.7	53.81		53.82	0.000009	0.76	91.67	15.8	0.05
Hall	1063	Q2	374	47.29	56.06	49.96	56.18	0.000072	2.78	153.28	27.43	0.17
Hall	1063	Juv Low	1	47.29	51.83	47.34	51.83	0	0.01	68.07	15	0
Hall	1063	Juv High	32	47.29	53.21	47.81	53.21	0.000002	0.36	88.78	15	0.03
Hall	1063	Res Low	2	47.29	51.97	47.37	51.97	0	0.03	70.2	15	0
Hall	1063	Res High	55	47.29	53.6	48.04	53.61	0.000005	0.58	95.09	17.4	0.04
Hall	1063	Adlt Low	3	47.29	52.08	47.39	52.08	0	0.04	71.79	15	0
Hall	1063	Adlt High	133	47.29	54.47	48.63	54.49	0.000018	1.23	112.97	23.34	0.08
Hall	1063	Max EDF	70	47.29	53.81	48.16	53.82	0.000007	0.72	98.81	18.95	0.05
Hall	1061.5		Inl Struct									
Hall	1057	Q2	374	46.9	55.45	49.58	55.58	0.000078	2.86	147.82	27.04	0.17
Hall	1057	Juv Low	1	46.9	51.15	46.95	51.15	0	0.02	63.82	15	0
Hall	1057	Juv High	32	46.9	52.54	47.42	52.54	0.000002	0.38	84.55	15	0.03
Hall	1057	Res Low	2	46.9	51.3	46.98	51.3	0	0.03	66	15	0
Hall	1057	Res High	55	46.9	52.94	47.64	52.95	0.000006	0.61	90.68	15.36	0.04
Hall	1057	Adlt Low	3	46.9	51.41	47	51.41	0	0.04	67.66	15	0
Hall	1057	Adlt High	133	46.9	53.85	48.24	53.87	0.00002	1.27	107.84	22.59	0.09
Hall	1057	Max EDF	70	46.9	53.16	47.77	53.17	0.000008	0.75	94.12	17.06	0.05
Hall	1052.5		Inl Struct									
Hall	1051	Q2	374	46.49	54.68		54.81	0.000091	3	138.3	26.16	0.18
Hall	1051	Juv Low	1	46.49	50.49		50.49	0	0.02	59.95	15	0
Hall	1051	Juv High	32	46.49	51.86		51.87	0.000003	0.4	80.6	15	0.03
Hall	1051	Res Low	2	46.49	50.63		50.63	0	0.03	62.09	15	0

Attachment E
Hec-Ras Water Surface Summary
Hall Creek Fish Passage
December 11, 2013

Hall	1051	Res High	55	46.49	52.25			52.25	0.000006	0.64	86.38	15	0.05
Hall	1051	Adlt Low	3	46.49	50.74			50.74	0	0.05	63.76	15	0
Hall	1051	Adlt High	133	46.49	53.1			53.13	0.000024	1.34	100.66	20.02	0.09
Hall	1051	Max EDF	70	46.49	52.45			52.46	0.000009	0.78	89.36	15	0.06
Hall	1045	Q2	374	45.69	54.69	48.37		54.8	0.000066	2.71	157.39	27.35	0.16
Hall	1045	Juv Low	1	45.69	50.49	45.74		50.49	0	0.01	71.95	15	0
Hall	1045	Juv High	32	45.69	51.86	46.21		51.87	0.000002	0.35	92.7	16.04	0.02
Hall	1045	Res Low	2	45.69	50.63	45.77		50.63	0	0.03	74.09	15	0
Hall	1045	Res High	55	45.69	52.25	46.44		52.25	0.000004	0.56	99.33	18.37	0.04
Hall	1045	Adlt Low	3	45.69	50.74	45.79		50.74	0	0.04	75.76	15	0
Hall	1045	Adlt High	133	45.69	53.1	47.03		53.12	0.000016	1.19	117.18	23.22	0.08
Hall	1045	Max EDF	70	45.69	52.45	46.56		52.46	0.000006	0.69	103.11	19.56	0.05
Hall	1043.5		Inl Struct										
Hall	1039	Q2	374	45.28	54.09	47.96		54.21	0.000071	2.77	152.39	26.93	0.16
Hall	1039	Juv Low	1	45.28	49.81	45.33		49.81	0	0.01	68.02	15	0
Hall	1039	Juv High	32	45.28	51.19	45.8		51.19	0.000002	0.36	88.67	15	0.03
Hall	1039	Res Low	2	45.28	49.96	45.36		49.96	0	0.03	70.2	15	0
Hall	1039	Res High	55	45.28	51.6	46.03		51.6	0.000005	0.58	95.05	16.95	0.04
Hall	1039	Adlt Low	3	45.28	50.07	45.38		50.07	0	0.04	71.79	15	0
Hall	1039	Adlt High	133	45.28	52.49	46.62		52.51	0.000018	1.23	112.62	22.44	0.08
Hall	1039	Max EDF	70	45.28	51.81	46.15		51.81	0.000007	0.71	98.73	18.23	0.05
Hall	1034.5		Inl Struct										
Hall	1033	Q2	374	44.88	53.36			53.49	0.000081	2.89	144.01	26.18	0.17
Hall	1033	Juv Low	1	44.88	49.15			49.15	0	0.02	64.01	15	0
Hall	1033	Juv High	32	44.88	50.53			50.53	0.000002	0.38	84.72	15	0.03
Hall	1033	Res Low	2	44.88	49.29			49.29	0	0.03	66.14	15	0
Hall	1033	Res High	55	44.88	50.92			50.92	0.000006	0.61	90.57	15.24	0.04
Hall	1033	Adlt Low	3	44.88	49.4			49.4	0	0.04	67.74	15	0
Hall	1033	Adlt High	133	44.88	51.78			51.8	0.000021	1.28	106.05	20.71	0.09
Hall	1033	Max EDF	70	44.88	51.12			51.13	0.000008	0.75	93.77	16.52	0.05
Hall	1027	Q2	374	44.48	53.37	47.15		53.49	0.000068	2.74	155.27	27.35	0.16
Hall	1027	Juv Low	1	44.48	49.15	44.53		49.15	0	0.01	70.01	15	0
Hall	1027	Juv High	32	44.48	50.53	45		50.53	0.000002	0.35	90.73	15.32	0.03
Hall	1027	Res Low	2	44.48	49.29	44.56		49.29	0	0.03	72.14	15	0

Attachment E
Hec-Ras Water Surface Summary
Hall Creek Fish Passage
December 11, 2013

Hall	1027	Res High	55	44.48	50.92	45.23	50.92	0.000005	0.57	97.2	17.87	0.04
Hall	1027	Adlt Low	3	44.48	49.4	44.58	49.4	0	0.04	73.74	15	0
Hall	1027	Adlt High	133	44.48	51.78	45.82	51.8	0.000017	1.21	115.05	23.21	0.08
Hall	1027	Max EDF	70	44.48	51.12	45.35	51.13	0.000007	0.7	100.95	19.2	0.05
Hall	1025.5	Inl Struct										
Hall	1021	Q2	374	44.08	52.76	46.76	52.88	0.000074	2.82	149.89	26.91	0.17
Hall	1021	Juv Low	1	44.08	48.48	44.13	48.48	0	0.02	65.93	15	0
Hall	1021	Juv High	32	44.08	49.85	44.6	49.85	0.000002	0.37	86.57	15	0.03
Hall	1021	Res Low	2	44.08	48.62	44.16	48.62	0	0.03	68.1	15	0
Hall	1021	Res High	55	44.08	50.26	44.83	50.27	0.000005	0.59	92.82	16.22	0.04
Hall	1021	Adlt Low	3	44.08	48.73	44.18	48.73	0	0.04	69.77	15	0
Hall	1021	Adlt High	133	44.08	51.15	45.42	51.18	0.000019	1.25	110.03	22.28	0.08
Hall	1021	Max EDF	70	44.08	50.47	44.95	50.48	0.000008	0.73	96.42	17.66	0.05
Hall	1017	Inl Struct										
Hall	1016	Q2	374	43.74	51.77		51.91	0.000097	3.05	140.37	34.72	0.19
Hall	1016	Juv Low	1	43.74	47.81		47.81	0	0.02	60.98	15	0
Hall	1016	Juv High	32	43.74	49.18		49.19	0.000003	0.39	81.65	15	0.03
Hall	1016	Res Low	2	43.74	47.95		47.95	0	0.03	63.16	15	0
Hall	1016	Res High	55	43.74	49.58		49.59	0.000006	0.63	87.64	15	0.05
Hall	1016	Adlt Low	3	43.74	48.06		48.06	0	0.05	64.77	15	0
Hall	1016	Adlt High	133	43.74	50.42		50.44	0.000023	1.33	102.36	21.58	0.09
Hall	1016	Max EDF	70	43.74	49.78		49.79	0.000009	0.77	90.64	15.41	0.06
Hall	1009	Q2	374	43.27	51.78	45.94	51.9	0.000078	2.84	159.77	38.17	0.17
Hall	1009	Juv Low	1	43.27	47.81	43.32	47.81	0	0.01	68.03	15	0
Hall	1009	Juv High	32	43.27	49.18	43.79	49.19	0.000002	0.36	88.7	15	0.03
Hall	1009	Res Low	2	43.27	47.95	43.35	47.95	0	0.03	70.21	15	0
Hall	1009	Res High	55	43.27	49.58	44.02	49.59	0.000005	0.58	95.21	18.25	0.04
Hall	1009	Adlt Low	3	43.27	48.06	43.37	48.06	0	0.04	71.82	15	0
Hall	1009	Adlt High	133	43.27	50.42	44.61	50.44	0.000019	1.23	114.06	26.91	0.08
Hall	1009	Max EDF	70	43.27	49.78	44.14	49.79	0.000007	0.72	99.06	20.32	0.05
Hall	1007.5	Inl Struct										
Hall	1003	Q2	374	42.87	51.13	45.54	51.26	0.000086	2.93	155.47	38.71	0.18
Hall	1003	Juv Low	1	42.87	47.13	42.92	47.13	0	0.02	63.96	15	0

**MILL (WATEK) CREEK
CULVERT REPLACEMENT
FINAL REPORT**

EXHIBIT NO. 6
APPLICATION NO.
1-07-013-A3 - CALTRANS
MILL CREEK CULVERT
REPLACEMENT REPORT (1 of 13)

LOCATION

The project is located on a tributary to the North Fork of the Mad River, approximately 2 miles east of Blue Lake (Figure 1), on Riverside Road (County Road #5L005). The project may be located on the USGS Korbelt Quadrangle Map, Section 32, Township 6N, Range 2E (Lat. 40°51'50"N, Long. 123°58'12"W).

PROJECT PURPOSE:

The purpose of this project was to replace the existing culvert system under Riverside Road at PM 0.8, with a new culvert that is not be a barrier to fish migration.

The existing installation was identified as undersized, a velocity barrier and flow dissipater. Winter storm flows regularly over-topped Riverside Drive flooding the surrounding pastures and causing damage to the Green Diamond nursery. The low grade and detention effect of the culverts encouraged fines to settle in the creek bed obscuring gravel substrates.

Upstream of the project site there are approximately 0.98 square miles of drainage area and 5,200 feet of potential salmonid habitat at an average 2% grade. The watershed is only moderately sloped, dropping from 950 feet to 120 over a distance of 10,000 feet. The limits of the contributing watershed are shown in Figure 2. The creek has good base flow that continues throughout summer. In the vicinity of the proposed project, the creek has a gravelly bedload 1-2 inch in diameter in a sandy substrate. There is a dense willow and alder canopy shading the stream.

Mill Creek flows into the North Fork of the Mad River approximately 300' downstream of the proposed culvert installation. Green Diamond has a similar two culvert installation 300' upstream of the Riverside Road culvert installation. Green Diamond has expressed an interest in replacing their culvert system as well.

The project removed an existing velocity and flow dispersion, migration barrier; protecting downstream habitat by reducing the possibility of high flows washing out the culvert and road fill.

PROJECT DESCRIPTION:

The project excavated and removed the existing culverts and installed a 40' long 16'x 8' concrete box culvert countersunk to provide a natural creek bed flowline (see Figure 3). The installation includes rock slope protection at both the inlet and outlet of the culvert to reduce erosion.

The bottom of the new culvert is 3 feet below that of the removed pipe inlet, and was installed at a slope of 0.02ft/ft, to match the estimated slope of the natural stream grade upstream and downstream of the project. The naturalized average grade of the creek was estimated from 720 feet of thalweg survey.

Prior to the start of construction, the site was isolated from fish by placing fish exclusion fencing above and below the project reach. A qualified fish biologist surveyed the project reach for fish, relocating any that were found. Construction of the new culvert required traffic to be detoured around the construction site. Green Diamond has a crossing upstream of the construction site that was used for the detour (See Figure 4). A minor amount of vegetation was removed to construct the project, grasses, shrubs, and small trees, including 5 Alders and Willows > 12" in diameter.

The volume of excavation needed for the culvert installation was 330 cy. The estimated volume of backfill for the new culvert was 40 cy, therefore a net of 290 cy was removed from the site for the culvert installation. The new culvert was wider and deeper than the existing channel so transitions from the installation were excavation extending roughly 30 feet upstream and downstream from the culvert.

Upon completion of the project, traffic was returned to Riverside Road and all disturbed lands were strawed and seeded with a native grass mix.

All earth, gravel and rock removed from the site were off-hauled and disposed of at a permitted disposal site.

FISH PASSAGE ANALYSIS:

Mill Creek is habitat for coho salmon and steelhead. The existing culverts were set at roughly the natural grade of the stream (~2% slope). The low volume capacity of the existing culverts created high velocities and backed up creek flows encouraging the deposition of suspended sediments and the dispersal of flows out onto the surrounding fields. The increased velocity presented a minor barrier to all ages of migrating salmonids and the dispersed flows stranded fish of all ages on occasion.

The new culvert is countersunk and is slightly wider than the creek channel. RSP secures the installation at the inlet and outlet of the culvert. The estimate of the natural stream grade was based on over 700 feet of thalweg profile survey information. The naturalized streambed now creates a seamless transition through the culvert installation that presents no difference to the migrating fish.

Only presence/absence monitoring will be performed to evaluate fish passage since it can be assumed that with the above parameters met, fish will be able to migrate. County maintenance crews will regularly monitor the culvert for hydraulic/debris issues that may affect the new installation and the migration of fish.

FISH RELOCATION:

The fish exclusion fence was installed on October 7. On October 11 representatives from the California Department of Fish and Game and interns from AmeriCorps and the California Conservation Corps electro-fished the exclusion area. A total of 9 fish mostly 1+ year class steelhead and 2 red-legged frogs were relocated in this effort:

ELECTRO-FISHING RESULTS

<u>Date</u>	<u>Species</u>	<u>Year Class</u>	<u>Total Number</u>
10/11/2011	Steelhead	0+	1
	Steelhead	1+	8
	Red Legged Frogs		2
	Cumulative Total		11

All fish/wildlife were released upstream of the impacted area.

EROSION CONTROL PLAN:

Construction was initiated in the first week of October, 2011. Construction within the creek channel was completed quickly because the culvert was pre-fabricated.

The erosion control plan had the following components: silt fencing, sedimentation dams, straw coverage, native plant revegetation and rock facing of susceptible slopes (Figure 4).

Sand bagged silt fences were installed in the creek, both upstream and downstream of the construction site. All disturbed drainages flowing into the creek had straw bale sediment dams installed on them. Any accumulated sediment at these installations was removed and trucked to an approved disposal site.

Excavated material that is suitable for backfill was temporarily stockpiled on the closed portions of Riverside Drive adjacent to the work site. Stockpiled material was contained to prevent fine sediment from entering the creek in the event of unexpected rain. Unsuitable material was trucked away to an approved disposal site.

WATER MANAGEMENT PLAN:

Stream flows were piped around the excavation during removal of the existing culverts. The flow bypass piping was sandbagged through a dam inside of the fish exclusion fencing. Flow was reintroduced into the creek beyond the excavation limits and just inside of the fish exclusion fencing (Figure 4).

SCHEDULE OF CONSTRUCTION OPERATIONS:

The project was constructed through the early fall 2011. All work within the creek channel was completed by October 26, 2011.

The following is a brief chronological description of project activities performed:

<u>DATES, 2011</u>	<u>DESCRIPTION OF WORK PERFORMED</u>
June 28	Bid project
Aug. 11	Finalized permitting
Aug. 16	Awarded contract
Oct. 6	Placed gates and prepared detour
Oct. 7	Installed fish exclusion fencing
Oct. 11	Electro-Fished project reach
Oct. 12	Cleared and grubbed site
Oct. 12	Constructed water bypass and activate
Oct. 12	Began excavation of existing culverts
Oct. 15	Structure excavation completed
Oct. 19-20	Installed culvert base
Oct. 25	Installed culvert top
Oct. 26	Backfilling completed
Oct. 26	Water bypass decommissioned
Oct 31	Removed fish exclusion fencing
Nov. 1	Based roadway
Nov. 2	Paved roadway

PROJECT COSTS:

The project costs have been broken out into categories as follow:

DESIGN

<u>Expenditure</u>		<u>Funding</u>	
Engineering	\$18,876.82	Pacific States Marine Fisheries Commission Grant	\$15,026.00

COUNTY DESIGN COST

\$ (3,850.82)

CONSTRUCTION

<u>Expenditure</u>		<u>Funding</u>	
Engr, Permts & ROW	\$ 25,323.78		
Construction Contract	\$175,514.71		
Construction Total	\$200,838.49	Caltrans Mitigation Funding	\$203,720.00

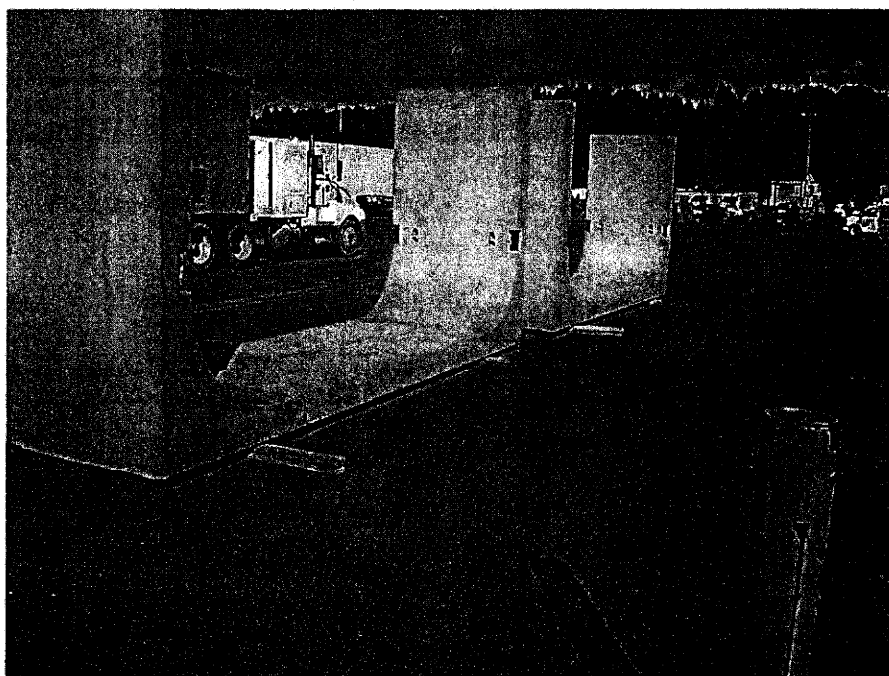
SURPLUS FUNDING

\$ 2,881.51

30913



DETOUR PREPARATION



PRECAST CULVERT INVERTS

4013



CLEARING VEGETATION



ELECTRO-FISHING

5213

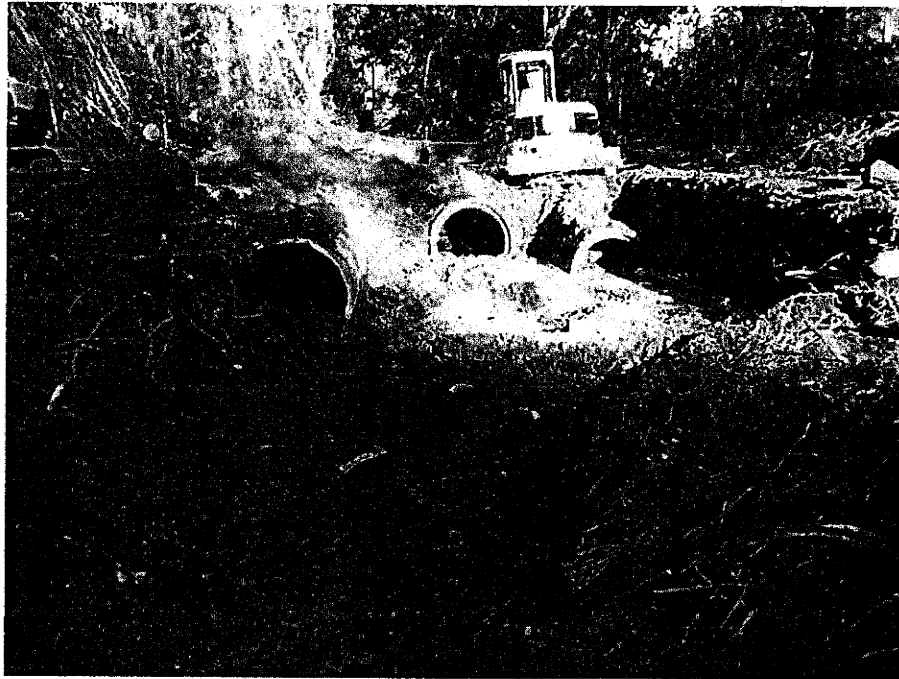


FISH IDENTIFICATION



INSTALLING WATER BYPASS

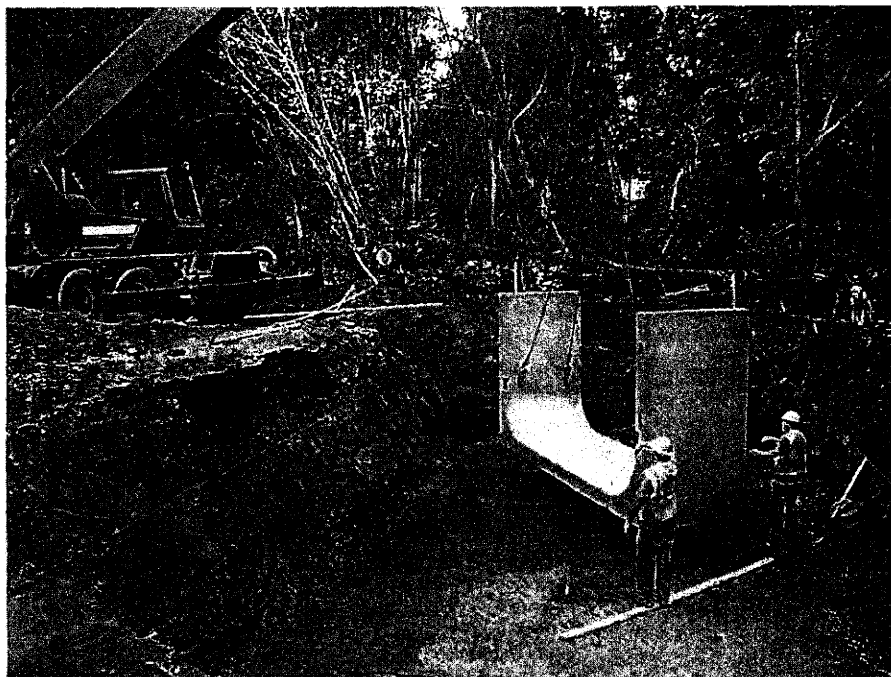
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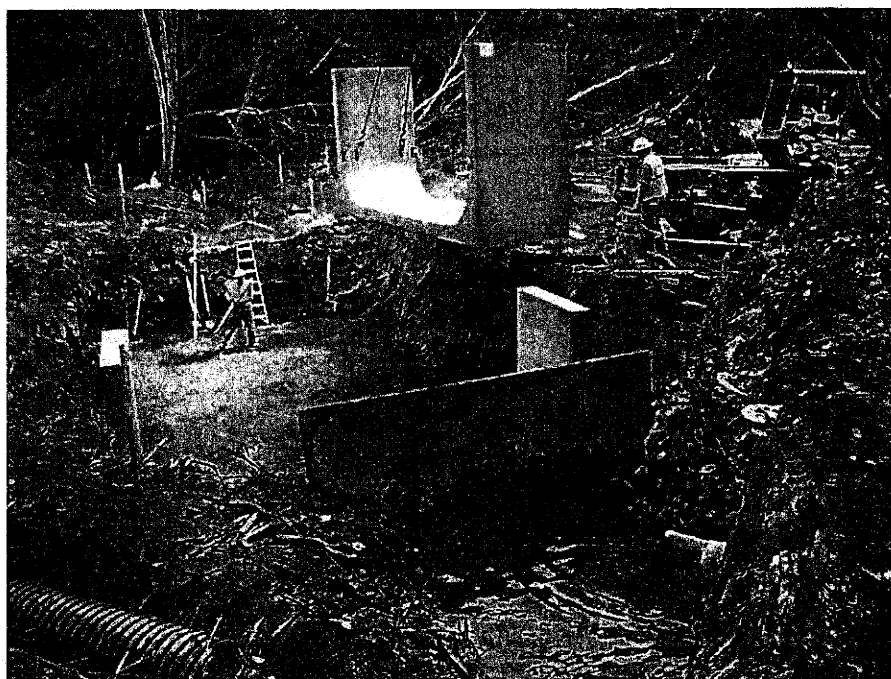
EXCAVATING EXISTING CULVERTS



PREPARING CULVERT BEDDING

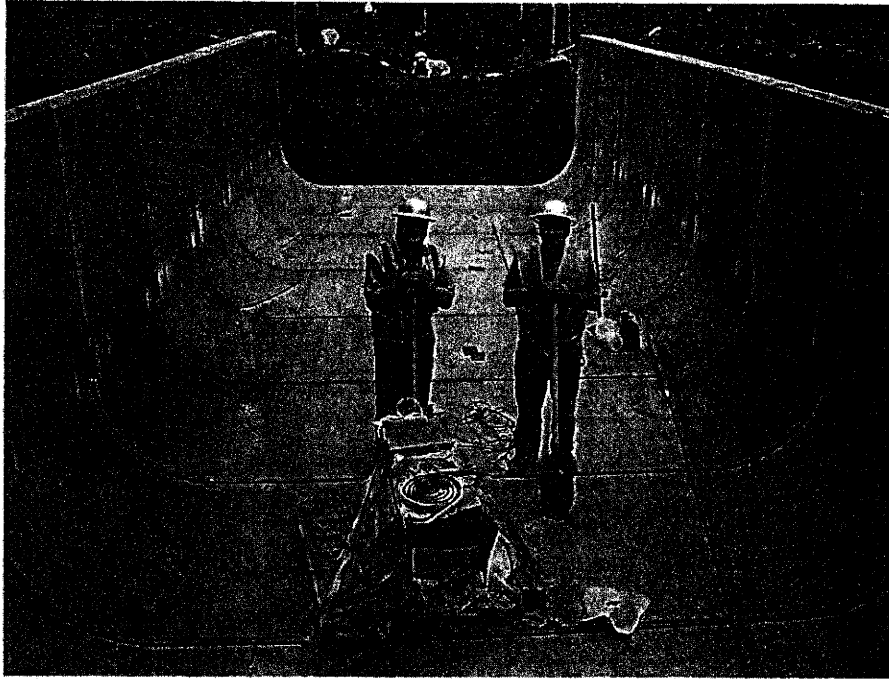


INSTALLING CULVERT INVERT



INSTALLING CULVERT INVERT

8 of 13



CULVERT INVERT

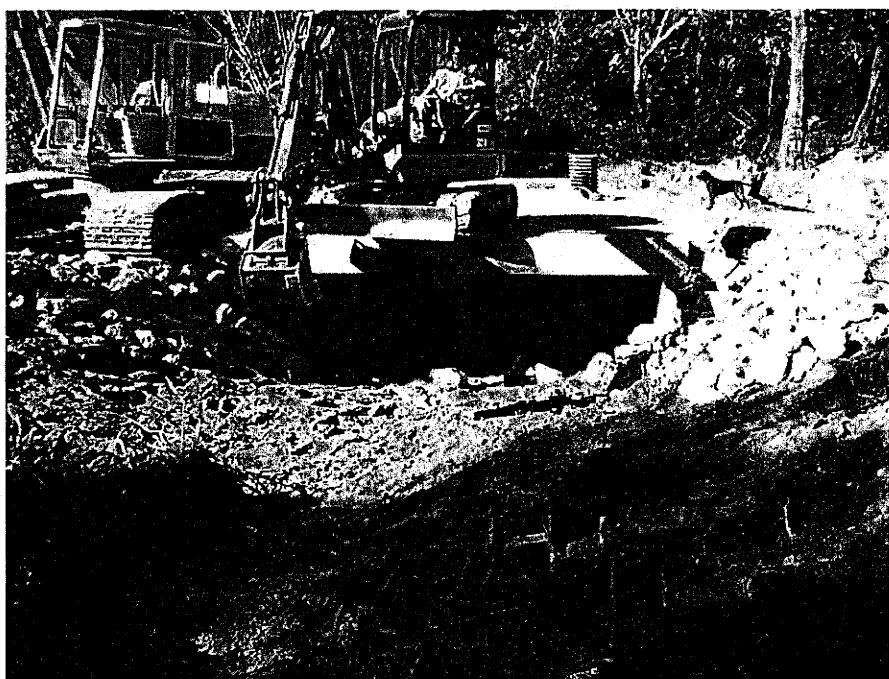


BACKFILLING INVERT WITH RIVER RUN

9 of 13



PLACING CULVERT TOP



INSTALLING ROCK SLOPE PROTECTION

1D of 13



RELEASING WATER DIVERSION DAM



BACKFILLING CULVERT

11 of 13



PLACING AGGREGATE BASE



PAVING ROADWAY

120913



COMPLETED PROJECT UPSTREAM VIEW



COMPLETED PROJECT ROADWAY VIEW

13 of 13

Blue Lake Mad River Weir Removal Mitigation Project

01-HUM-101 PM 89.1/90.4
EA: 01-296104
Project ID: 0100000084
District Agreement Number 01-0368

Project Completion Report

November 2013

Funding for this Project was provided through an agreement with CALTRANS



Submitted to:

Susan Leroy
Associate Biologist
California Department of Transportation
North Region Environmental Planning
1656 Union Street
Caltrans, Eureka

Prepared By:

Humboldt County Resource Conservation District
5630 South Broadway
Eureka, CA 95503

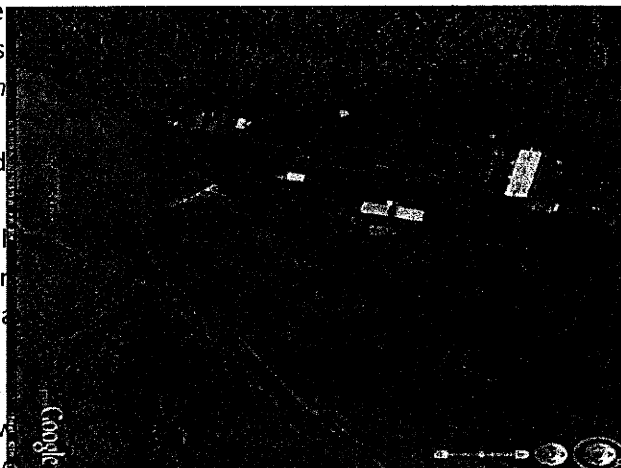
EXHIBIT NO. 7

APPLICATION NO.

1-07-013-A3 - CALTRANS
MAD RIVER WEIR REMOVAL
PROJECT (1 of 29)

EXECUTIVE SUMMARY

The waters of the Mad River in Humboldt County provide critical habitat for several rare or endangered fish species including; 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 1982, an 18 foot-wide, one foot thick, reinforced concrete weir extending 195 feet across the Mad River was constructed at river mile 12.3; adjacent to the California Department of Fish and Wildlife (CDFW) fish hatchery. According to CDFW documents, the purpose of the weir was to direct Chinook salmon and steelhead into the hatchery ladder.



The weir's concrete sill started to fail after the first high winter flows. Within a few years, CDFW determined that the weir was not achieving its purpose. The weir did not prove necessary to divert steelhead into the fish ladder and was not effective at diverting Chinook into the ladder. In 2002 there was an attempt to demolish the weir, but it only succeeded in opening a hole in the concrete and exposing some of the internal rebar. The partial de-construction and subsequent water damage further exposed internal rebar, posing a trapping hazard for fish and unsafe conditions for the recreating public in this section of the Mad River. The weir also acted as an artificial channel control affecting sediment transport (as is shown clearly in the photo above) and posed a low-flow barrier to all salmonids and other fishes within this reach of the river.

In 2011, representatives from the California Department of Fish and Wildlife, Caltrans, National Marine Fisheries Service, and Humboldt County Resource Conservation District (HCRCD) began to collaborate on a project to remove the weir. By 2012 all necessary permits were secured and funding for the project was made available through a Cooperative Agreement between CALTRANS and HCRCD. Funding was provided by CALTRANS as mitigation for impacts resulting from the replacement of two bridges on State Route 101 in Humboldt County. The project was successfully completed in 2013. A post-project field review with representatives of CALTRANS was completed on November 7, 2013.

This report has been prepared in conformance with the California Salmonid Stream Habitat Restoration Manual, Volume 1, Part VIII, Project Evaluation and Monitoring. It documents HCRCD's performance and successful completion of items 1-18 and item 20 as detailed in CALTRANS Cooperative Agreement 01-0368, Exhibit B – Scope of Work. Item 19 in the Scope of Work requires HCRCD to perform a low-flow survey after the first winter, post-construction. It further requires that the findings of that survey be documented in a memo along with photographic evidence. Once the post-project survey is completed, a memo and photo documentation will be provided to CALTRANS as an addendum to this report. The addendum will be provided to CALTRANS no later than December 1, 2014, as required.

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APPENDICES

- Appendix 1: Pre and Post Photo Documentation
- Appendix 2: As Builts - Site Map, Design Plans, Stream Profile and Cross Sections
- Appendix 3: Project General Information Form and Site Completion Form

INTRODUCTION

The Humboldt County Resource Conservation District, in cooperation with CALTRANS, California Department of Fish and Wildlife, and the National Oceanic and Atmospheric Administration/National Marine Fisheries Service, restored approximately 875 feet of the Mad River adjacent to the Mad River Fish Hatchery outside Blue Lake, California in Humboldt County.

Fish removal was performed by the CDFW on Sept 18th, 2013, immediately prior to restoration work by Steelhead Constructors, Inc. (Redding, CA). The work encompassed demolition and removal of the Mad River fish weir, the extension of the hatchery's fish ladder and chute, the grading of the western river channel, and the construction of five log habitat structures. Work was completed on November 1st, 2013.

PRE-PROJECT INFORMATION

The following provides existing and pre-project conditions of the project area including aquatic species, channel habitat, spawning substrate and sediment composition, water quality, riparian, watershed conditions, and photographs.

1. Aquatic Species

Native Endangered Species Act listed and nonlisted aquatic species inhabit the lower Mad River watershed. These species include Chinook and Coho salmon, summer and winter-run steelhead, resident rainbow trout, coastal cutthroat trout, California roach, three-spine stickleback, riffle and prickly sculpins, Pacific lamprey, brook lamprey, and green sturgeon. Non-native fish species include brown bullhead, channel catfish, Sacramento sucker, largemouth bass, crappie, and bluegills.

Historically, commercial quantities of Chinook salmon were caught in the Mad River late 1800s and early 1900s. In 1952, salmonid surveys indicated that the number of Chinook observed at Sweasy dam was just over 6,000 individuals. By mid 1960s, coho and Chinook were down to under 500 individuals. In 2000, 101 individuals were counted at North Fork Mad River.

2. Channel Habitat

The Mad River channel in the lower watershed is a low gradient meandering-to-braided channel with adjacent floodplains and terraces of Late Pleistocene and Holocene age. The reach from the Mad River Hatchery to the Blue Lake Bridge is an alluvial channel with alternating bars, point bars, and medial bars that are confined by narrow floodplains. The main channel Mad River has been documented to have a pool-riffle morphology, where pools typically form from meander bends and bedrock exposures (Stillwater Sciences 2010).

Prior to restoration, the reach contained the Mad River weir which reached across the entire width of the main stem channel when it was installed in 1982. Over the course of two decades, the main river channel cut around the east end of the weir, thus creating a primary eastern channel and a narrow high flow channel along the western bank. The main stem channel consisted of shallow runs and a large pool. The western channel contained flowing water in a run-pool morphology.

The weir was installed to encourage the upstream migration of fish to enter the Mad River Fish Hatchery's fish ladder on the western side of the channel. As the river redirected its flow primary around the eastern end of the weir, rather than to continue flowing over the weir as designed, and with the degradation of the concrete weir over time, the weir itself became dysfunctional.

3. Spawning Substrate and Fine Sediment Composition

The channel substrate at the restoration reach is composed of large to small cobbles with additional gravel and fine sediment. It is estimated that over 1 million tons of suspended sediments flow down the Mad River each hydrologic year. Mobilization of these sediments occurs during high flow periods which coincide with fall and winter salmonid runs. The main stem of the Mad River is reported to contain suitable spawning areas for Chinook salmon (Coho and steelhead primarily spawn in adjacent tributaries).

4. Water Quality

The following excerpt on flow regime comes from the Mad River Watershed Assessment prepared by Stillwater Sciences for the Redwood Action Agency:

It is reported that the average annual temperature in the Lower Mad River watershed is between 63 and 65°F. Daily average discharge in the watershed is seasonally dependent with most large runoff events occurring during the winter. During November-March, the high flow period, the average daily discharge is approximately 2,000-5,000 cfs. Flows can vary greatly during the winter with maximum mean daily discharges exceeding 30,000 cfs during wet years while under 1,000 cfs in dry years (Graham Matthews & Associates 2007). High flows in the watershed tend to be of short duration, returning to winter base flow within a week following the peak event (Graham Matthews & Associates 2007).

At the USGS Arcata gage, the average annual discharge of the Mad River Basin is approximately 1,000,000 acre-ft. For the record period of 1982-2000, the "drier than normal years" average annual discharge was 488,629 acre-feet while the "wetter than normal years" average annual discharge was 1,434,857 acre-feet (HBMWD 2004). Notable years with above average annual discharge include 1953, 1958, 1964, 1973, 1982, 1995, 1996, 1998, and 2006. Extended periods of higher than average annual discharges include 1969-1975, 1981-1986, and 1995-1998. Years with less than half the average annual discharge (500,000 acre-feet) include 1976, 1977, 1985,

1992, 1993, 2001, and 2007. The ten year period between 1985 - 1994 saw continual average flow in the basin.

5. Riparian Species and Density

The riparian corridor along the main stem Mad River near the hatchery is composed of mixed conifer and hardwood (redwood, cottonwood, alder, and willow) and shrubs. Canopy cover along the main stem is documented to be less than 10%.

6. Watershed Conditions and Uses

The above mentioned watershed assessment concludes that the main stem Mad River appears to have improving instream habitat over that past 25 to 30 years in terms of instream habitat for adult Chinook and Coho salmonids. Main stem pool percentages (by stream length) have ranged from 18% in 1999 to 27% in 2006 to 22% in 2007 while pool depths have general remained the same (Trush 2008). Though the watershed has experienced some improvement, the Environmental Protection Agency added the Mad River to California's Clean Water Act Section 303(d) impaired water list for elevated sediment/siltation and turbidity in 1992. The North Coast Regional Water Quality Control Board identified water temperature as an additional impairment in 2006.

The lower Mad River has been influenced by a long history of anthropogenic factors including settlement, timber harvest, road construction, gravel mining, grazing, and flood control. The restoration reach is not influenced by any gravel mining, all gravel mining occurs downstream of the project area.

AS-BUILT (PROJECT COMPLETION) DOCUMENTATION

The following is a description of actual work accomplished and includes: project location; As-Built description; description and objective of structures built; and cost of the total project.

1. Location Information

The project is located at the Mad River Fish Hatchery in Humboldt County, California; Latitude 40° 51.256'N, Longitude 123° 59.387', Section 31, Township N, Range 2E, U.S. Geological Survey map Korbel, Humboldt Base and Meridian; Assessor's Parcel Number 313-097-10.

The upper point of the restoration reach is approximately 340 feet upstream from the weir foot print (at terminus of public access trail), and 800 feet downstream (at hatchery wheel chair ramp).

2. As-Built Description, Photos and Drawings

During construction, the partners worked together taking an adaptive approach to field fit the design and assure that the final project would function optimally. Staff of CDFW and NOAA/NMFS provided field guidance regarding various design features. The Mad River Fish Weir Removal and Fish Ladder Extension Project included:

- Removal of the concrete and steel fish weir structure (approx. 195'), including 46 steel pilings (1 piling next to the fish ladder was cut off below ground level)
- Extension of the original hatchery fish ladder an additional 25'
- Removal of a 1.5" diameter wire cable spanning the channel with associated signage
- Relocation of 2-4 ton boulders surrounding the fish weir
- Placing protective rip-wrap along the fish ladder and the adjacent bank
- Extension of a hatchery fish chute (approx. 6')
- Construction of five habitat structures in the channel
- Re-grading of approx. 875' of adjacent western river channel and center gravel bar
- Rehabilitation of staging area with seed and mulch over disturbed areas

3. Description of Structures and Objectives

- Extension of Fish Ladder – The fish ladder has a 25' extension added to the end of the original. The concrete wall thickness mirrors the original ladder's, however the height of the extension is 6' high as compared to the original's 8'. The extension design placed the interval of the steel channels, where wood beams can be inserted for jump pool creation, every 6.25'. The extension follows an 11.2% slope of elevation. The extension allows the ladder to back flow with water during low flow periods.
- Extension of Fish Chute – The fish chute closest to the fish ladder is utilized for releasing adult or large fish from the hatchery. As rip-rap was placed around the fish ladder and the adjoining banks to stabilize and protect the area from erosion and large flows, it became apparent that the length of the fish chute wouldn't allow fish to clear the placed rip-rap. Therefore the concrete chute was extended out approximately 6', terminating above an excavated pool.
- Creation of five habitat structures – These structures are located within a 500' proximity of the fish ladder. Wood for the structures was furnished by Caltrans. The structure design called for base boulders sourced from the area around the fish weir to be buried at 2 feet below graded channel, or existing thalweg, with the logs anchored above by existing boulders. The structures

will provide the channel with habitat diversity by creating scour pools on the downstream side of each structure and generating instream shelter for adult and juvenile fish.

4. Cost of project

The award from the CALTRANS contract for this work totaled \$362,006.55 and the total amount will be used to fully complete the project, including final post-project monitoring and the addendum report.

A competitive bid process was followed to select the contractor for the project. A total of three complete, qualified prevailing wage bids were received. A contract of \$267,777.00 was awarded to Steelhead Constructors, Inc. as the lowest, responsive, responsible bidder. A total of five contract change orders were approved to cover the costs of agreed-upon changes during implementation to adapt to site conditions and to direction from agency representatives. The combined change orders totaled \$24,802.80, bringing total construction costs to \$292,579.80.

HCRCDC also contracted with GHD, Inc. a local consulting engineering company to provide engineering and design review, construction inspection, and bidding and contracting assistance. This contract was on a time and materials basis for an amount not to exceed \$45,000. Over the course of the project, HCRCDC provided general project coordination, contract and budget management, construction oversight, monitoring, and reporting services on a time and materials basis in accordance with the approved budget.

See Appendix 1 for:

- Pre and Post Photo Monitoring

See Appendix 2 for:

- Site Map
- River Channel Re-graded Map
- Fish Ladder Extension Design Plans
- Stream Profile and X-Sections
- Boulder/Log Structure Design

See Appendix 3 for:

- Project General Information and Site Completion Form sourced from CDFW's California Salmonid Stream Habitat Restoration Manual

REFERENCES

Stillwater Sciences. 2010. Mad River Watershed Assessment (Draft). Prepared by Stillwater Sciences, Arcata, California for Redwood Community Action Agency, Eureka, California.

Graham Matthews & Associates. 2007. Mad River sediment source analysis. Final report. Prepared by Graham Matthews & Associates, Weaverville, California for Tetra Tech, Inc., Fairfax, Virginia.

Trush, B. 2008. Lower Mad River anadromous salmonid habitat trends between WY 1994 and WY 2007. Prepared by McBain and Trush, Arcata, California.

Mad River Weir Removal and Fish Ladder Extension – Project Completion

Pre and Post Construction Photo Monitoring

Photo Point Monitoring Map



Appendix 1

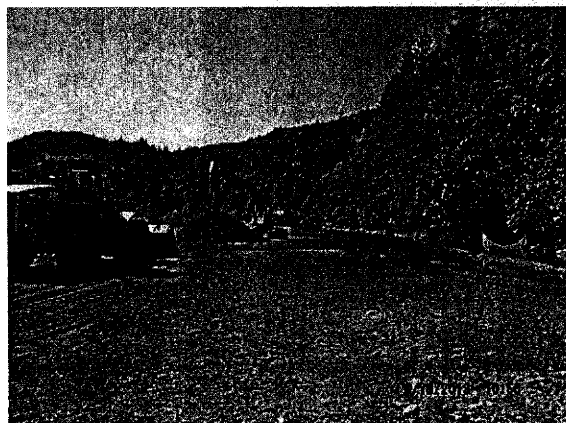
Photo Point 1 (PP1)



PP1 - Left Bank – 18 September 2013



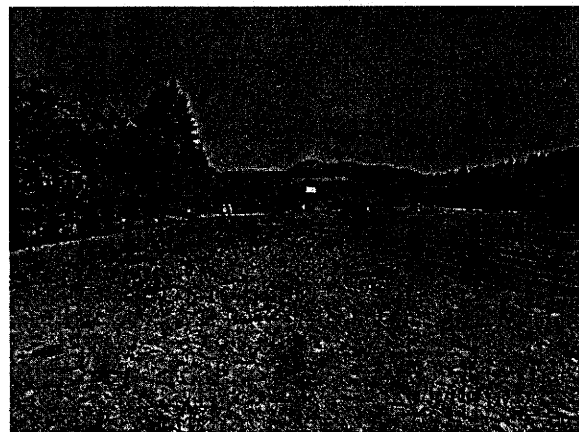
PP1 - Left Bank – 8 November 2013



PP1 - Upstream – 18 September 2013



PP1 - Upstream – 8 November 2013



PP1 - Downstream – 18 September 2013



PP1 - Downstream – 8 November 2013

Appendix 1

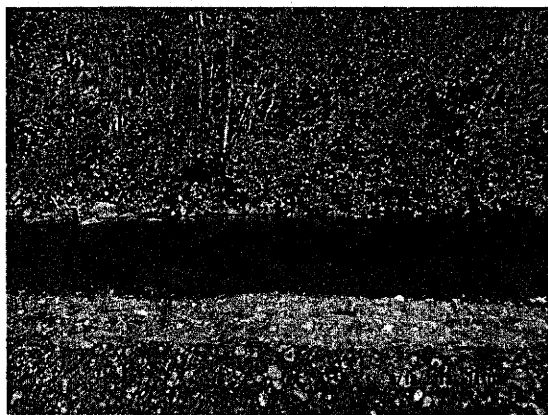


PP 1 – Right Bank – 18 September 2013

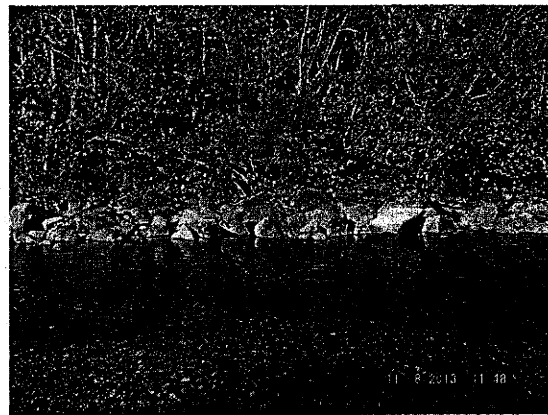


PP1 – Right Bank – 8 November 2013

Photo Point 2 (PP2)



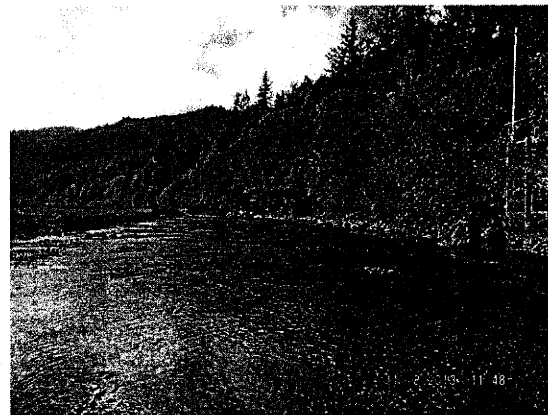
PP2 – Left Bank – 18 September 2013



PP2 – Left Bank – 8 November 2013

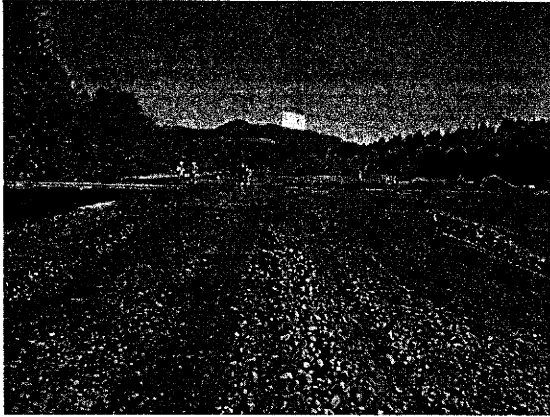


PP2 – Upstream – 18 September 2013



PP2 – Upstream – 8 November 2013

Appendix 1



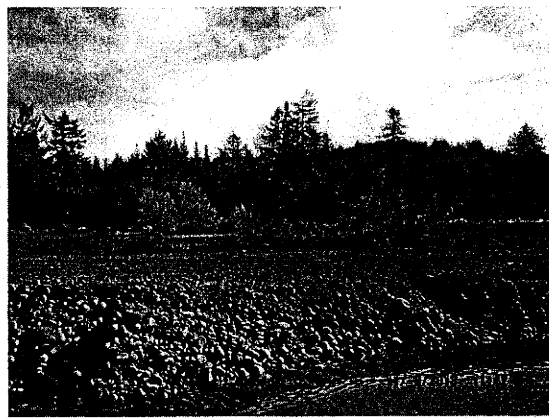
PP2 – Downstream – 18 September 2013



PP2 – Downstream – 8 November 2013



PP2 – Right Bank – 18 September 2013



PP2 – Right Bank – 8 November 2013

Photo Point 3 (PP3)



PP3 – Upstream – 18 September 2013



PP3 – Upstream – 8 November 2013

Appendix 1



PP3 – Downstream – 18 September 2013

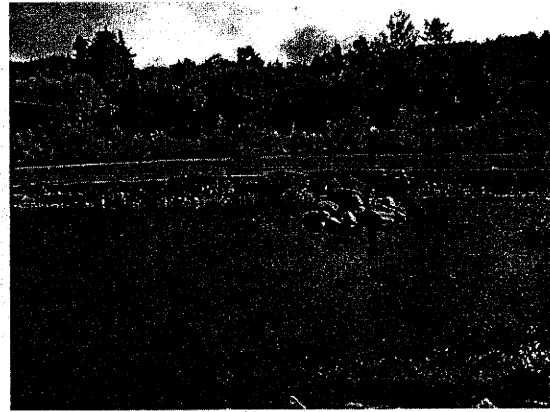


PP3 – Downstream – 8 November 2013

Photo Point 4 (PP4)



PP4 – Weir Right Bank – 18 September 2013



PP4 – Weir Right Bank – 8 November 2013

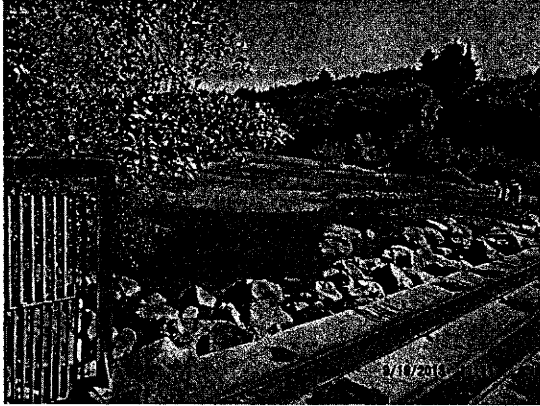


PP4 – Weir Upstream – 18 September 2013



PP4 – Weir Upstream – 8 November 2013

Appendix 1

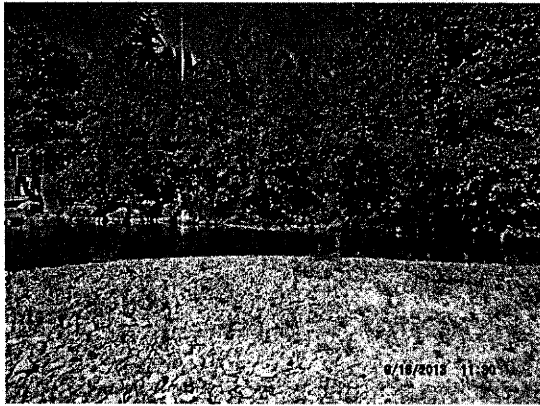


PP4 – Weir Downstream – 18 September 2013



PP4 – Weir Downstream – 8 November 2013

Photo Point 5 (PP5)



PP5 – Left Bank – 18 September 2013



PP5 – Left Bank – 8 November 2013

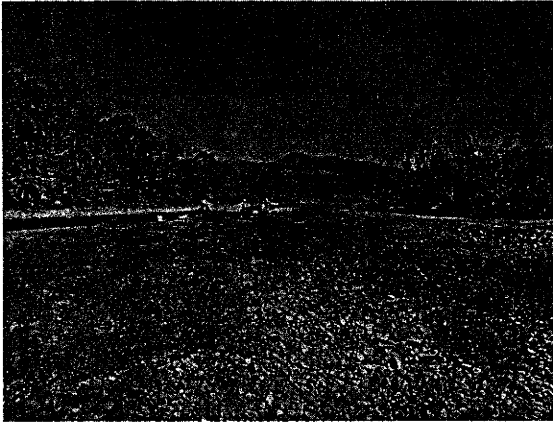


PP5 – Upstream – 18 September 2013

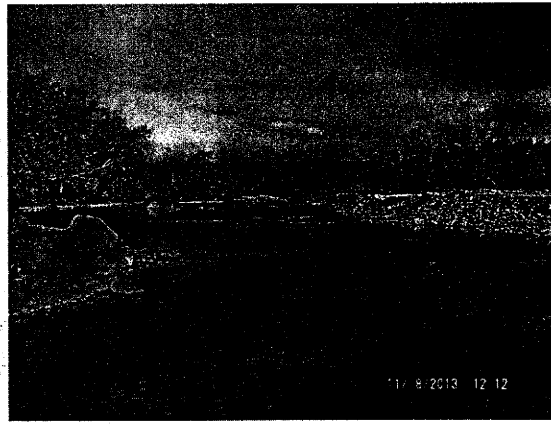


PP5 – Upstream – 8 November 2013

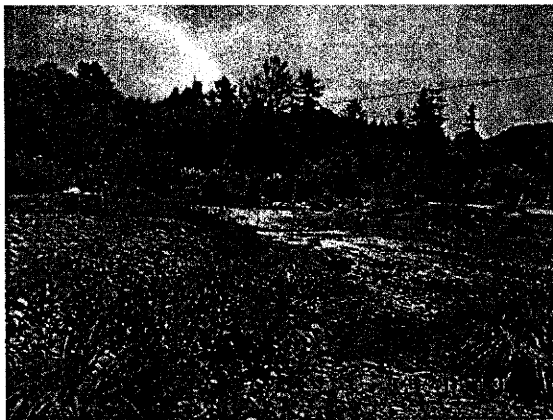
Appendix 1



PP5 – Downstream – 18 September 2013



PP5 – Downstream – 8 November 2013



PP5 – Right Bank – 18 September 2013



PP5 – Right Bank – 8 November 2013

Photo Point 6 (PP6)

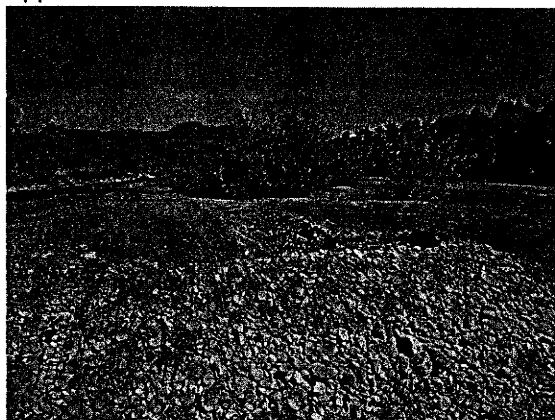


PP6 – Upstream – 18 September 2013



PP6 – Upstream – 8 November 2013

Appendix 1



PP6 – Downstream – 18 September 2013



PP6 – Downstream – 8 November 2013

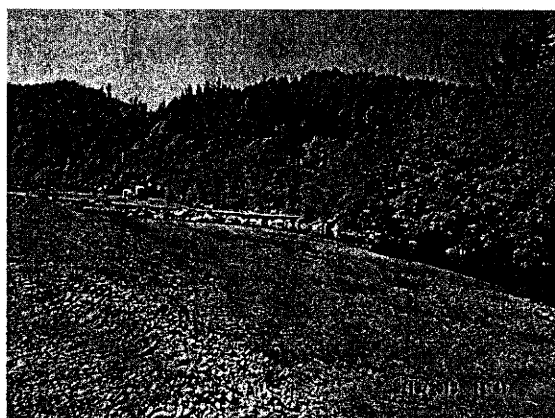
Photo Point 7 (PP7)



PP7 – Left Bank – 18 September 2013



PP7 – Left Bank – 8 November 2013



PP7 – Upstream – 18 September 2013



PP7 – Upstream – 8 November 2013

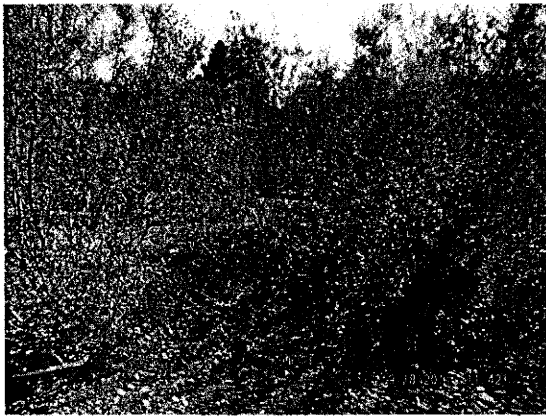
Appendix 1



PP7 – Downstream – 18 September 2013



PP7 – Downstream – 8 November 2013



PP7 – Right Bank – 18 September 2013



PP7 – Right Bank – 8 November 2013

Photo Point 8 (PP8)

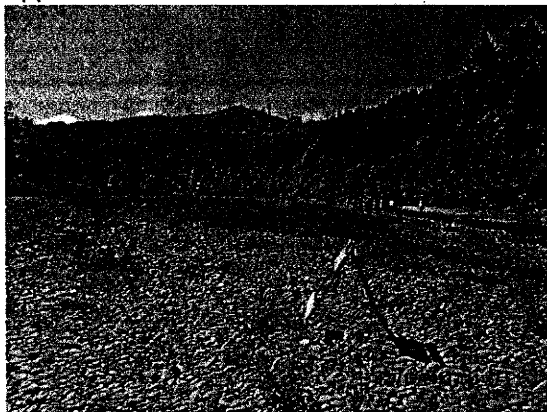


PP8 – Left Bank – 18 September 2013



PP8 – Left Bank – 8 November 2013

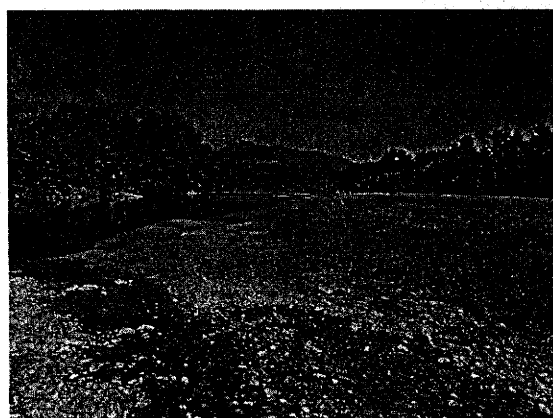
Appendix 1



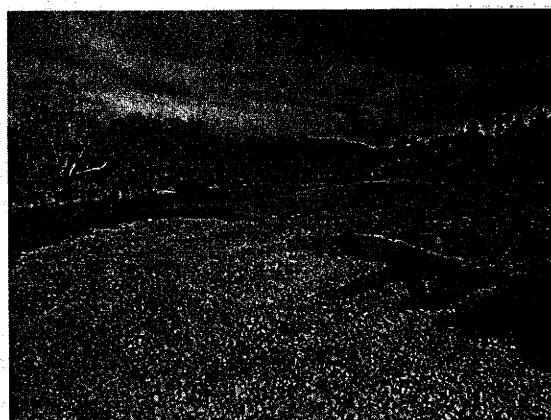
PP8 – Upstream – 18 September 2013



PP8 – Upstream – 8 November 2013



PP8 – Downstream – 18 September 2013



PP8 – Downstream – 8 November 2013

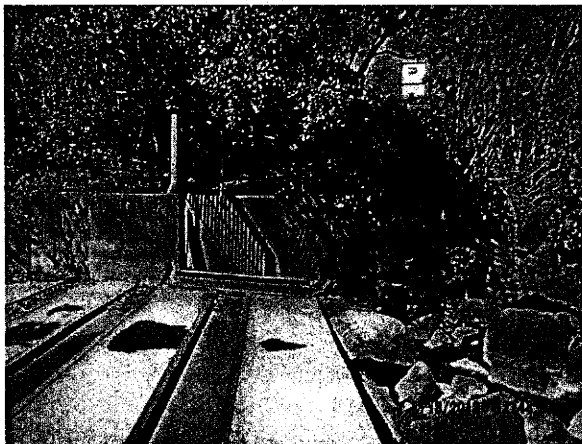


PP8 – Right Bank – 18 September 2013



PP8 – Right Bank – 8 November 2013

Appendix 1
Fish Ladder



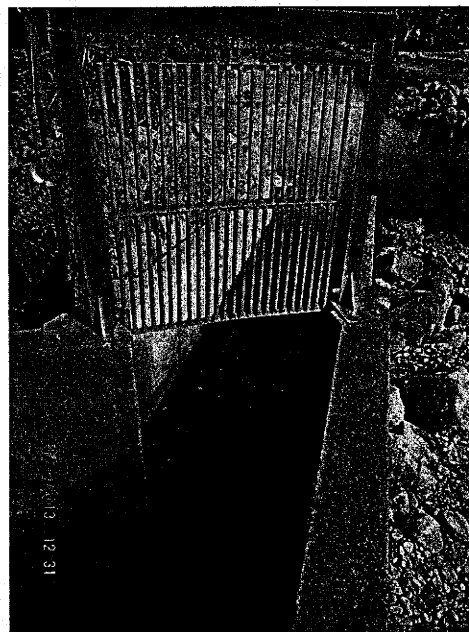
Left Bank – 18 September 2013



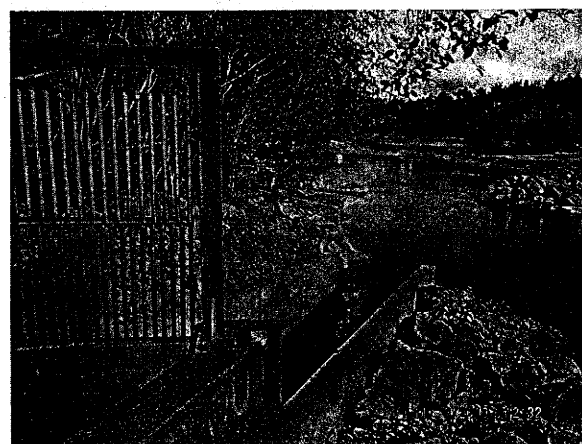
Left Bank – 8 November 2013



Fish Ladder - Downstream – 18 September 2013



Fish Ladder – Downstream – 8 November 2013



Fish Ladder – Downstream – 8 November 2013

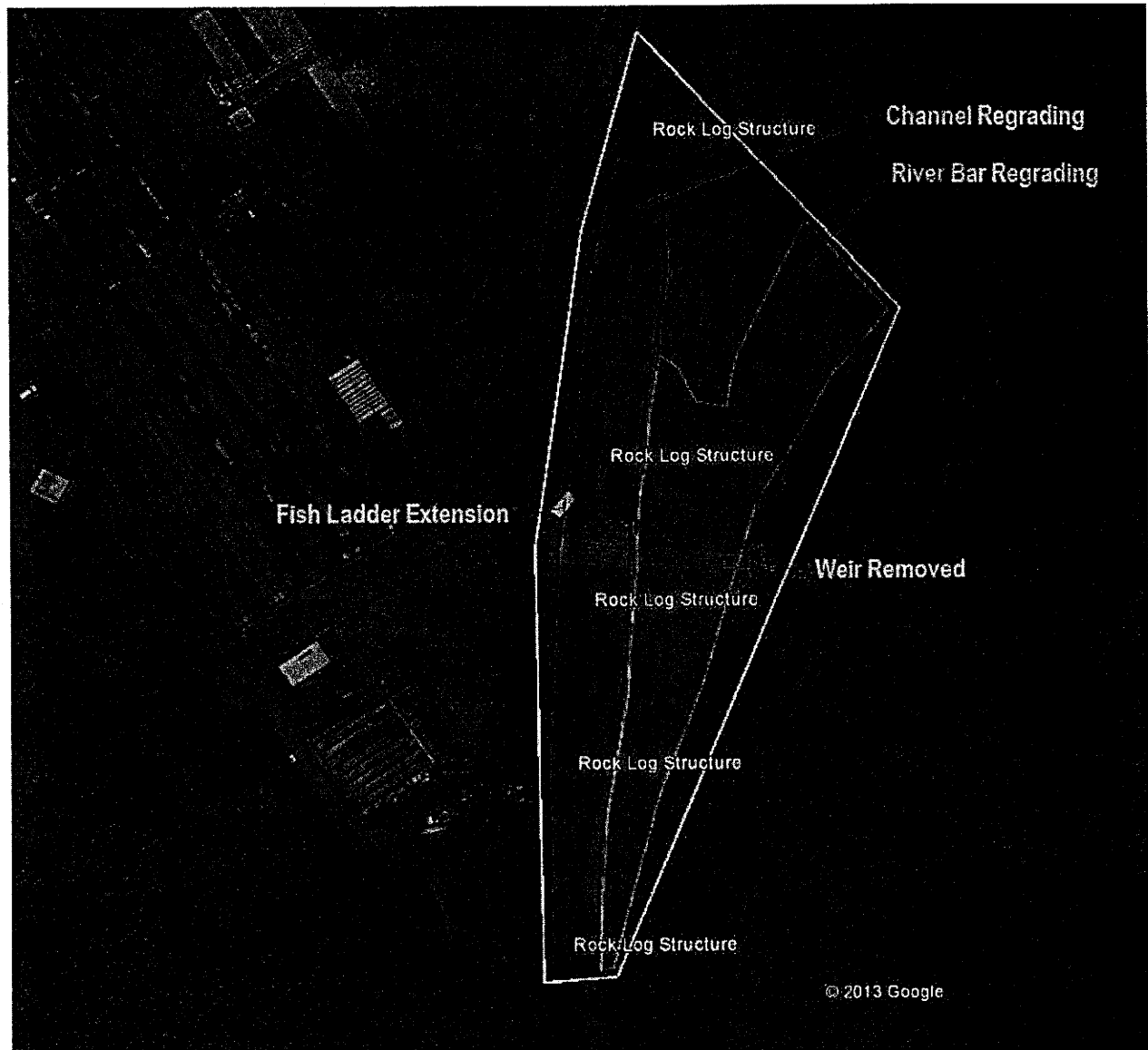
2013 Mad River Weir Removal and Fish Ladder Extension

APPENDIX 2

As-Built Description

2013 Mad River Weir Removal and Fish Ladder Extension

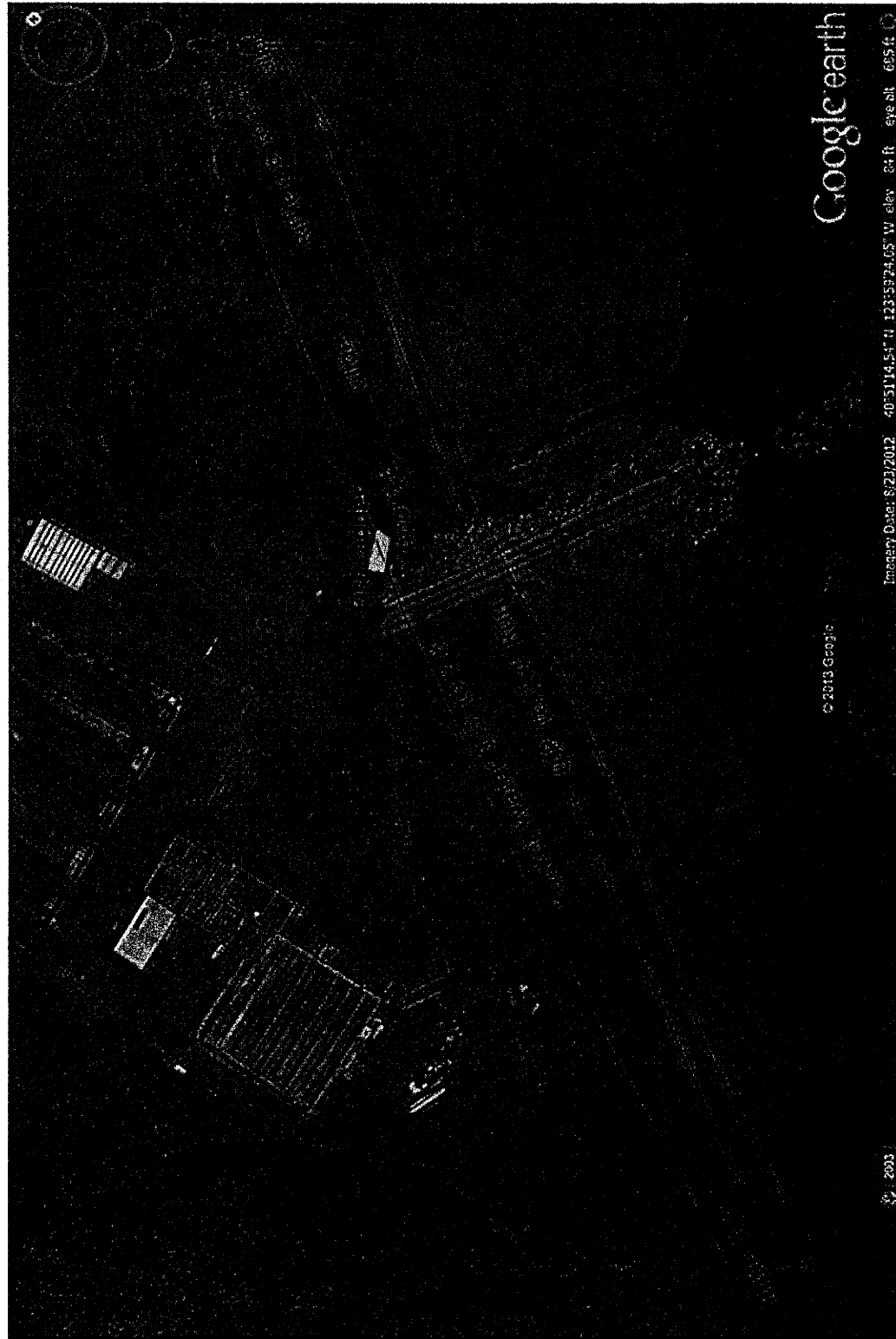
Project Description Site Map



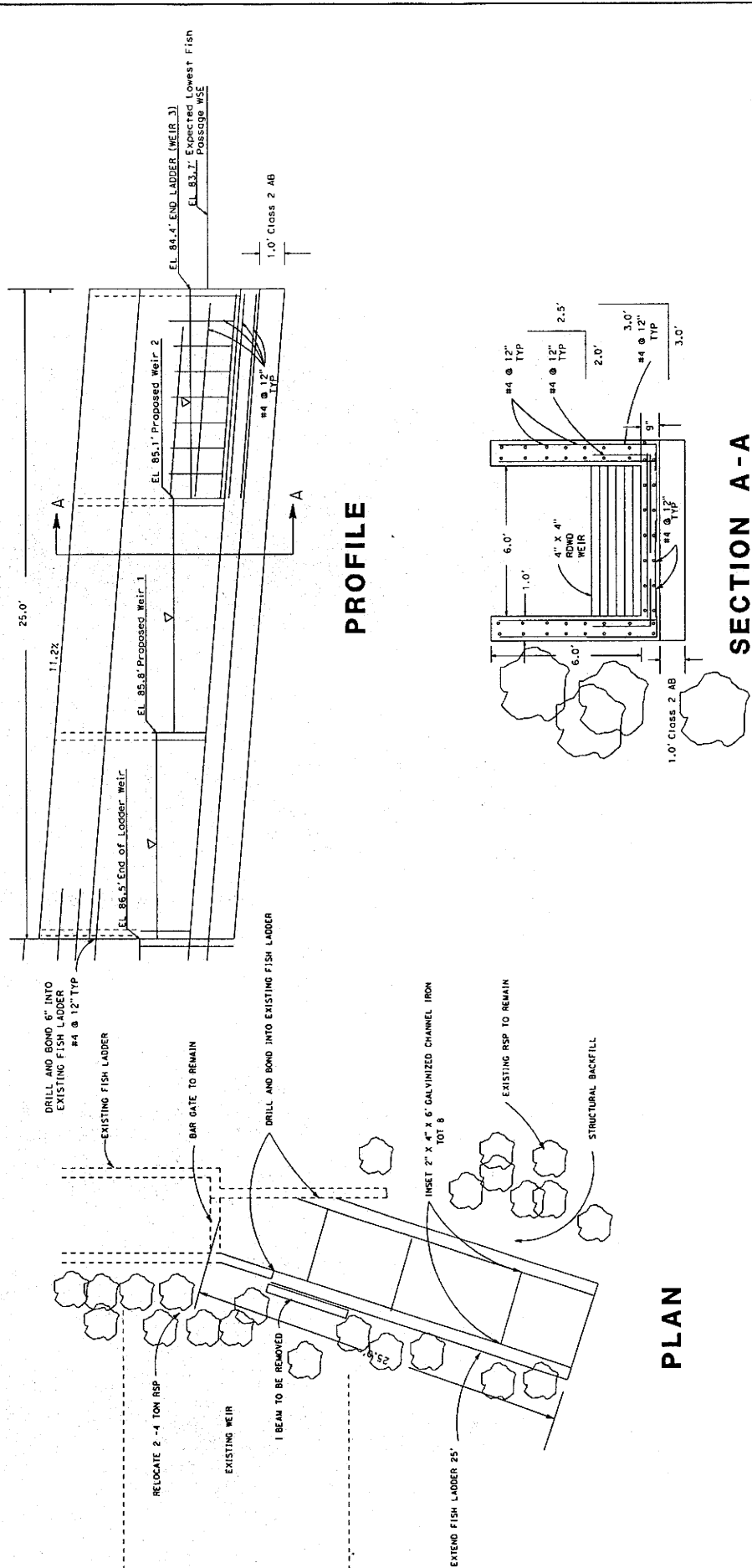
Appendix 2

2013 Mad River Weir Removal and Fish Ladder Extension - As-Built Re-Graded Channel Description

Push-Pins denote locations of the boulder/log structures



DATE	COUNTY	PROJECT	SHEET TOTAL
01	Hum	HATCHERY WEIR REMOVAL & LAUNDER EXTENSION	NO. SHEETS
REGISTERED CIVIL ENGINEER		DATE	8-23-13
PLANS APPROVAL DATE		8-23-13	
I, GLENN C. HUBBARD , CIVIL ENGINEER, LICENSE NO. 63003, DO HEREBY CERTIFY THAT THE ABOVE IS A TRUE AND CORRECT COPY OF THE ORIGINAL AS SUBMITTED TO THE STATE OF CALIFORNIA.			



STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	FUNCTIONAL SUPERVISOR	DESIGNED BY	CHECKED BY	DATE REVISED
9/3/2013 4:19:35 PM	9/3/2013 4:19:35 PM	9/3/2013 4:19:35 PM	9/3/2013 4:19:35 PM	9/3/2013 4:19:35 PM

CONSTRUCTION DETAILS

PROJECT NUMBER & PHASE: UNIT 0000

RELATIVE BORDER SCALE: 0 1 2 3

IS IN INCHES

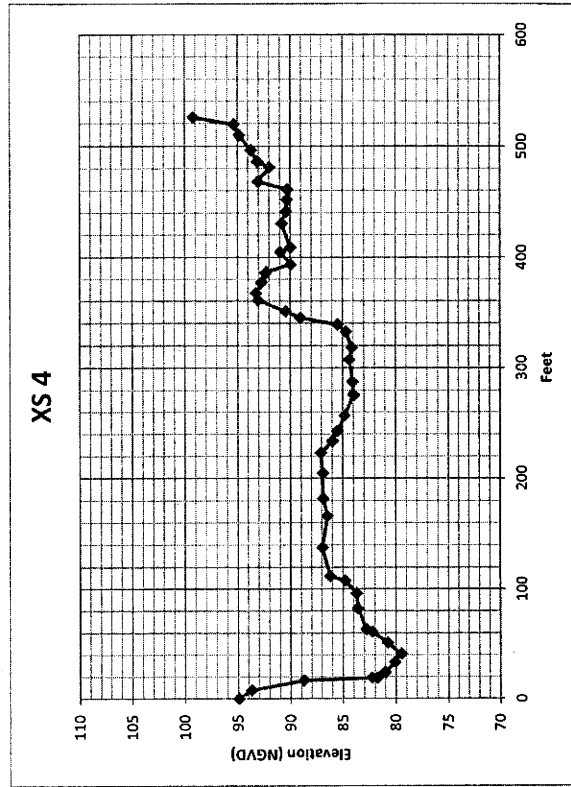
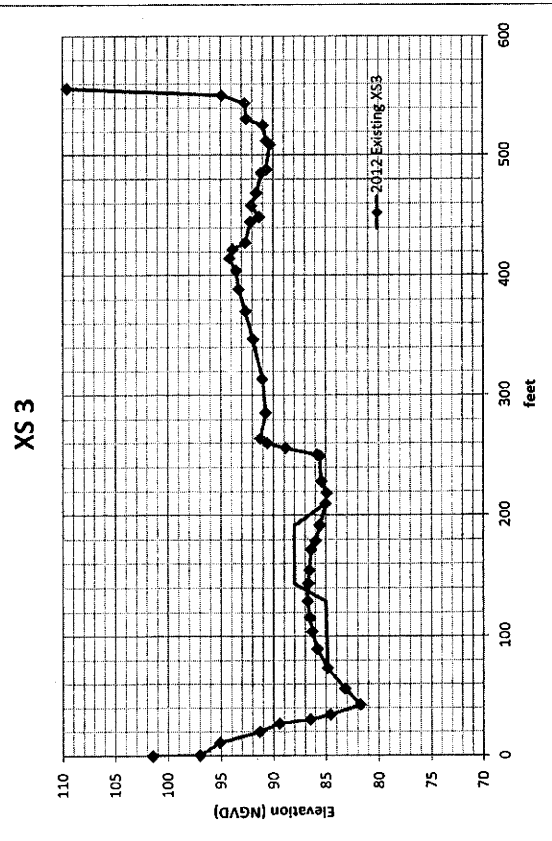
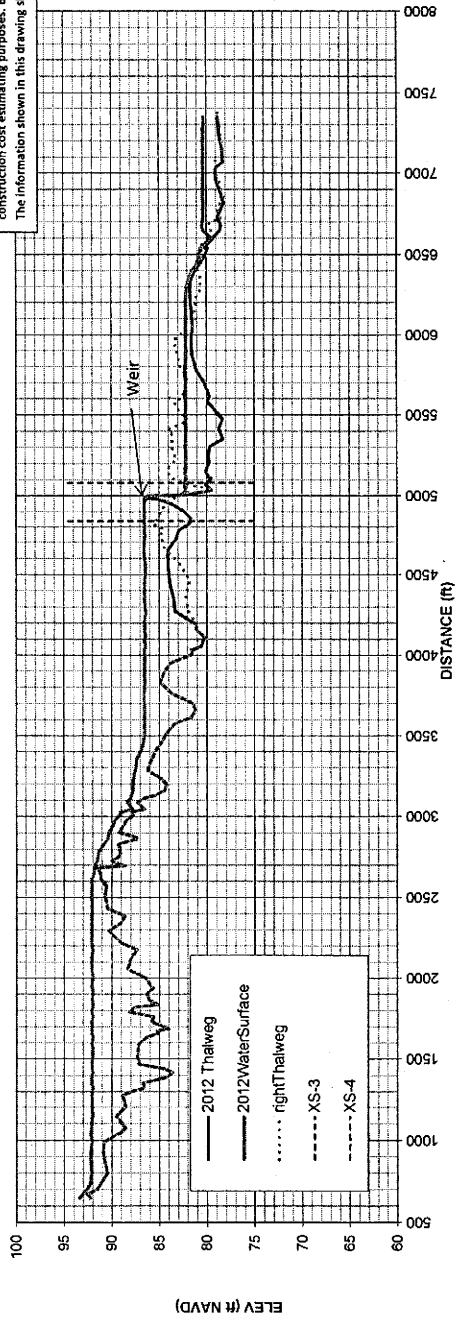
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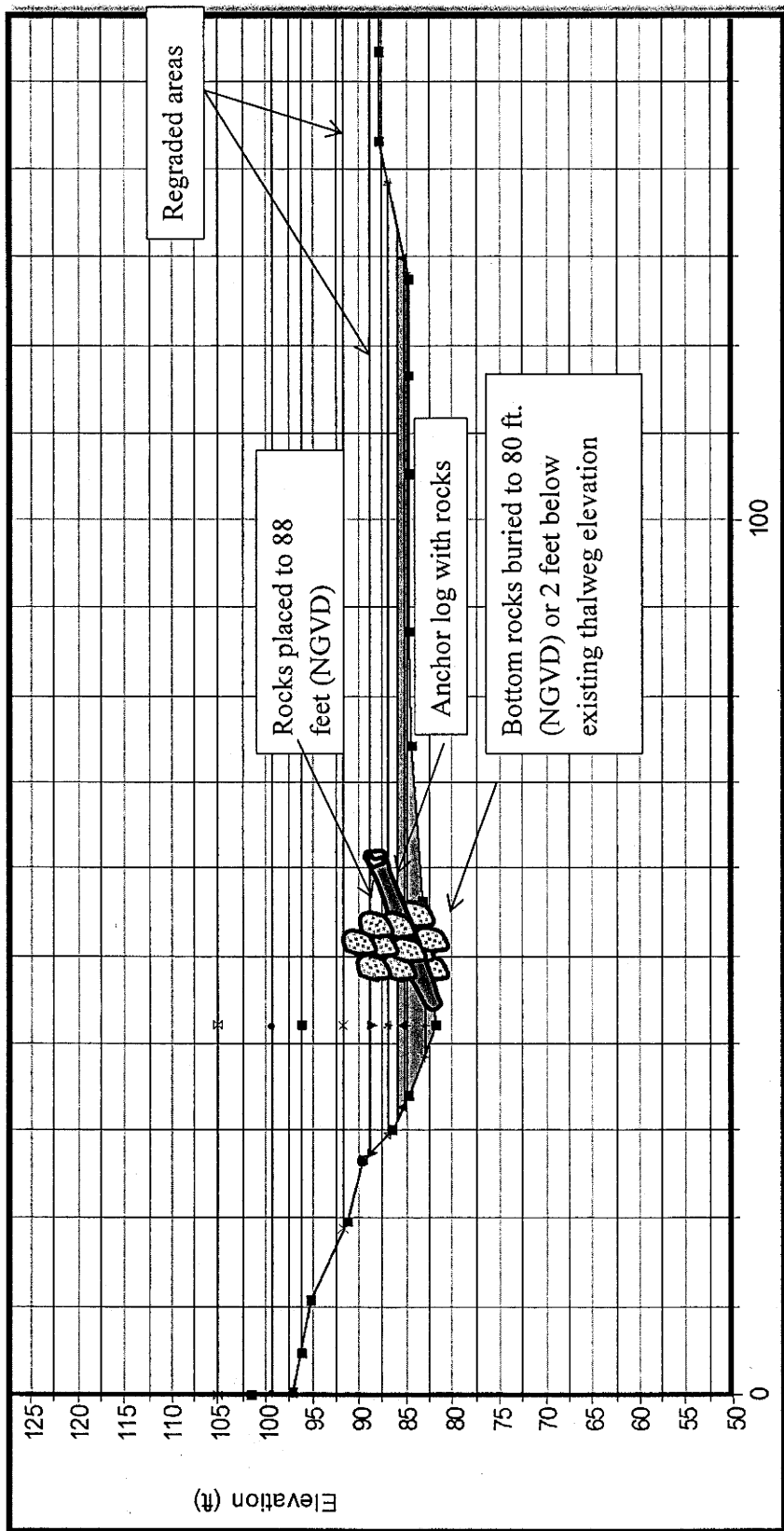
C-2

Humboldt County Resource Conservation District
 Mad River Hatchery Weir Removal and Fish Ladder Extension Project
 Reference Drawing 2

The information shown in this drawing is conceptual in nature to convey the design intent and shall not be solely relied upon for construction cost estimating purposes. Bidders are responsible for verifying field conditions prior to placing bids on this project. The information shown in this drawing shall not become the basis of a contract change order during construction.

2012 Mad River Stream Profile near Hatchery Weir





Cross Section Hatch3 typical rock/log structure placement. Placement at direction of CDFW.

Humboldt County Resource Conservation District
 Mad River Hatchery Weir Removal and Fish Ladder Extension Project
 Reference Drawing 3

The information shown in this drawing is conceptual in nature to convey the design intent and shall not be solely relied upon for construction cost estimating purposes. Bidders are responsible for verifying field conditions prior to placing bids on this project. The information shown in this drawing shall not become the basis of a contract change order during construction.

2013 Mad River Weir Removal and Fish Ladder Extension

APPENDIX 3

General Project Information Form

Project Site Completion Form

STREAM HABITAT ENHANCEMENT PROJECT EVALUATION

GENERAL PROJECT INFORMATION FORM

STREAM: Mad River WATERSHED: Mad River

EVALUATOR: CDFW, HURCD DATE: 8 Nov 2013

CONTRACT NO.: 0100000084 FY: 13, 14 FUND SOURCE: CalTrans

DFG CONTACT: Scott Bauer CONTRACTOR: Steelhead Constructors

DOES THIS CONTRACT INCLUDE OTHER STREAMS OR LOCATIONS: Y ☐ N ☒

AMOUNT SPENT ON EVALUATED PORTION OF CONTRACT: \$ 292,579.80 - TOTAL
(May include total contract amount or a portion of contract)

PROPERTY OWNER: CDFW - Mad River Fish Hatchery

ACCESS DIRECTIONS: At Blue Lake, CA; Take Hatchery Rd South to Mad River Fish Hatchery. Site is the Mad River adjacent to the hatchery.

CHANNEL TYPE(S): D3-D4 STREAM ORDER: 4-5 DRAINAGE AREA (SQ MI): 400 approx

USGS QUAD (7.5 MIN): ~~Blue Lake~~ Korbelt

PROJECT LOCATION AT DOWNSTREAM END: LAT. 40°56.25' N LONG. 123°59.33' W

DATE PROJECT COMPLETED: MONTH Nov YEAR 2013

DATE OF LAST EVALUATION: MONTH Nov YEAR 2013

PRE-PROJECT EVALUATION OR DATA AVAILABLE: Y ☒ N ☐ IF YES WHERE? Report - "Blue Lake Mad River Weir Removal Mitigation Project"

ARE AS-BUILT DATA OR PROPOSED DESIGNS AVAILABLE: Y ☒ N ☐ IF YES WHERE? Same as above

NO. OF STRUCTURES CONSTRUCTED: 7 NO. OF STRUCTURES EVALUATED: 0

COMMENTS: Structures: 1- Fish ladder extension, 1- Fish chute extension, 5- habitat structures. No evaluation - As-Built-Report

NUMBER OF EVALUATION PAGES ASSOCIATED WITH THIS FORM: 0

GENERAL PROJECT EVALUATION OR COMMENTS: _____

PROJECT SITE COMPLETION FORM

Stream: Mad River - Mad River Fish Hatchery Date: 8 Nov 2013 Page 1 of 1

Contractor/Organization: Steelhead Constructors

Inspector: CDFW, HCRCD, GHD

Contract No.: N/A FY: 13/14

Landowner: CDFW

Estimated Cost: \$267,777.52

Length of Project/Numbers of Structures: 875' Fish Ladder Extension; 5 boulder/log structures

Reference Point: Mad River Fish Hatchery Fish Ladder Lat: 40° 51' 25.6 N Long: 123° 59' 38.7

Feet From Reference Point: 500' up: downstream from weir ☒ UP / ☒ DN Channel Type: D3-D4

Constructed Using: ☐ Hand Crew

☐ Heavy Equipment

☒ Both

Project Objective: ☒ Instream Habitat

☒ Erosion Control

☒ Fish Passage

Type of structure: Fish weir removal, Fish ladder extension, Regrade west river channel, 5 rock/log structures

Project Completion Check Points:

YES

NO

1. Project techniques according to manual

☒

☐

If no, explain: _____

2. Materials of recommended type and size

☒

☐

If no, explain: _____

3. Structure positioned correctly to meet objectives

☒

☐

If no, explain: _____

4. Followed permit(s) specifications

☒

☐

If no, explain: _____

5. Landowner(s) agreed with work and materials used

☒

☐

If no, explain: _____

Original Habitat Type: LGR, POW, GLD, EDW

Target Habitat Type: LGR, POW, GLD, EDW, RUN, MCP

Habitat Maximum Depth: 3.8 ft.

Bankfull Stream Width: 280 ft.

Comments: Bankfull taken near deepest pool in project reach (end of fish ladder) Depth recorded when Mad River-Azusa-Monitoring Station recorded 4.4' Stage

If Revegetation: ☐ Riparian

☒ Upslope

☐ Both (photo required for revegetation.)

Describe Density or Coverage: Staging area was seeded and mulched in disturbed areas. Other construction areas are expected to naturally recruit.

Photographs: ☒ Yes

☐ No

If yes, location of photographs: 6 photo points w/in 500'

above fish weir. 2 photo points 500' downstream of fish weir.



Humboldt County Resource Conservation District

5630 South Broadway Eureka, CA 95503

Phone (707) 444-9708 ext. 117 Fax (707) 442-7614

hered@yahoo.com

July 22, 2014

Susan Leroy
CALTRANS
1656 Union Street
Eureka, CA 95501

EXHIBIT NO. 8

APPLICATION NO.

1-07-013-A3 - CALTRANS
WEIR REMOVAL FUNDING
LETTER

RE: 01-HUM-101 PM 89.1/90.4 Mad River Bridges Replacement – Channel Mitigation
EA: 01-296104
District Agreement No. 01-0368

Dear Susan,

The purpose of this letter is to confirm our conversation today regarding funding utilized by Humboldt County Resource Conservation District (HCRCD) to implement the above-named project.

During project development, project proponents sought funding from two separate sources: 1) Department of Fish and Wildlife (CDFW) and 2) Caltrans. In April of 2012 HCRCD executed a contract with CDFW. The contract with Caltrans was not executed until December of 2012. Between April and December of 2012 funding available under the CDFW grant was utilized by HCRCD to cover costs for: HCRCD staff time and overhead costs; securing project permits; completing a pre-project longitudinal profile; and finalizing construction plans and specifications for bid. Once the contract with Caltrans was executed, no other costs were charged to the CDFW grant.

The value of the Cooperative Agreement executed between HCRCD and Caltrans reflected the total cost of the project, less the minor costs for pre-implementation work already completed and previously billed to and reimbursed by the CDFW contract. The cost of the work billed to the CDFW grant totaled \$9,408.79. The total value of the Caltrans contract was \$362,006.55 which covered completion of the project and post-project surveys.

The project was successfully completed during the 2013 field season with post-project field reviews completed separately by the Caltrans and CDFW Grant Managers in November of that year. Please let me know if there is any additional information you need.

Sincerely,

Signature on File

Donna Chambers
Executive Director

Mad River Bridge Replacement**Final Wetland and Stream Channel Mitigation Plan****Pursuant to CDP 1-07-13 –condition 15D****November 28, 2012****Wetland Impacts Acreage Reduction**

In 2007 the CDP permit application stated that 1.72 acres of permanent and temporal impacts to coastal wetlands would occur during Project Years 1-3 (Mad River Bridges Replacement On-site Wetland and Riparian Mitigation and Monitoring Plan [MMP], November 2007, Table 1, page 7, submitted with the CDP application). This document is incorporated as Attachment A. However, on May 30, 2012 during a joint field review of the project site with Coastal Commission staff, we observed that no temporal impacts within the project's N/E quadrant (projected at 0.21 acre) actually occurred (polygons 35, 16, 17, 18 and 19; see MMP Exhibit 5, Impact Mapping). Therefore we will be mitigating for 1.51 acres (*vs. 1.72 acres*) of permanent and temporal impacts to wetland and riparian habitats that occurred during Project Years 1-4.

The Old Samoa Parcel Conceptual Mitigation Plan (dated November 2007) was previously submitted as a mitigation plan to satisfy approximately 5.4 acres of off-site coastal wetland mitigation credits that were anticipated to be necessary for the project. The Commission agreed that 2 acres could be used for mitigation.

Wetland Mitigation

The wetland impacts associated with the Mad River Bridges Replacement can be mitigated by the following:

- Implementation of the previously approved Mad River Bridges Replacement On-site Wetland and Riparian Mitigation and Monitoring Plan [MMP], November 2007 (Attachment A). A total of 1.57 acres of will be revegetated on-site. These areas will be planted in the spring of 2013, as proposed in the project's revegetation plan. This will account for a mitigation ratio of 1.04:1.
- Utilizing two (2) acres of off-site riparian habitat restoration at the Samoa parcel. This will be off-site, in-kind mitigation at a 1.3:1 ratio. This restoration occurred in 2010 and is described in Attachment B.
- Utilizing the balance of 1.53 acres of available credit at the Caltrans Elk River Mitigation Bank. This will account for off-site, in-kind mitigation at a 1.01:1 ratio. This bank was constructed over 20 years ago and wetlands are fully functional. Please refer to Report on the Function of Wetlands at the Elk River Mitigation Site, October 2002 (Attachment C) for details.

In this case Caltrans is proposing to mitigate at a ratio of 3.4:1 (versus 4:1). The Elk River bank was constructed over 20 years ago and wetlands are fully functional. Typically when there is no temporal loss a mitigation ratio of 1:1 is acceptable. Because there will be no temporal loss, a ratio of less than 4:1 is justified. Caltrans is seeking an amendment to reduce the acreage of impacts from 1.72 acres to 1.51 acres and to reduce the mitigation ratio from 4:1 to 3.4:1.

Stream Channel Disturbance

Condition 15 of CDP 1-07-013 requires Caltrans to submit a stream channel mitigation plan to compensate for all impacts to the Mad River stream channel (i.e., below top-of-bank) during the implementation of the project. Prior to the implementation of the project, temporary disturbances to the Mad River channel were projected to be 6.3 acres (2.1 acres per year); the area actually impacted during three years of in-channel construction totaled 1.03 acres, and includes the following:

- Clearing vegetation (once in 2009 to provide access for the duration of the project)
- Constructing an access road on the north bank (2011 and 2012)
- Constructing access road on south bank (2009, 2010, 2011 and 2012)
- Constructing a temporary settling pond on south bank (2009 only)
- Installing and dewatering cofferdams at Pier 3
- Installing gravel bar extension along south bank (2009, 2010, 2011 and 2012) and north bank (2011 and 2012)
- Installing falsework piles along the north bank (2010)

For ease of analysis, areas of the stream channel that were impacted have been broken down into the following categories:

- South bank access and staging area
- North bank access and staging
- Fish Exclusion Zone
- Falsework piles

All of these areas are depicted in Figure 1. The staging areas were digitized on ortho-rectified imagery based on onsite observations. These were large enough in extent to be measured using GIS tools. The areas of impact due to the FEZ and piles were estimated based on their geometry and extent of footprint.

Mad River Bridge Replacement NB & SB Access and Staging Impacts

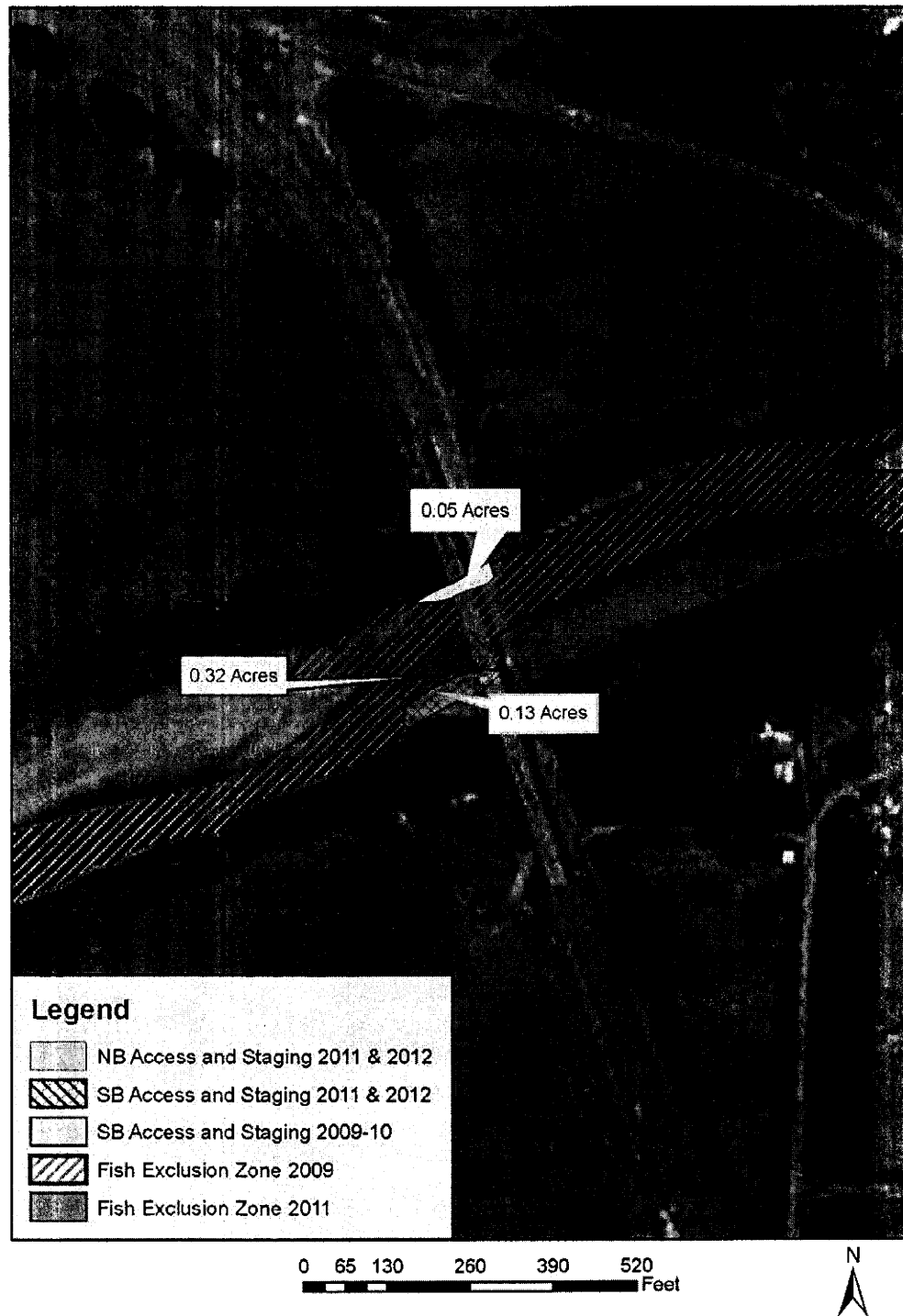


Figure 1.

Access to the south bank in 2009 required the removal of riparian vegetation from the channel. An access road was then constructed from the staging area to the gravel bar. A gravel bar extension was installed each year in order to provide a working platform for heavy equipment and falsework construction. In 2009, a settling basin was constructed on the south bank gravel bar on the west side of the southbound bridge. The basin was used to dewater the cofferdam at Pier 3. All of these activities were confined to the South Bank Access and Staging Area.

Access along the north bank for staging and construction occurred in 2011 and 2012. The north bank access road was used for falsework construction, and bridge demolition activities.

Stream channel impacts associated with fish exclusion resulted from contact of fish exclusion structures with the streambed. Structures included: gravel bags, metal fence posts, and water bladders. The area of impact to the channel from these structures is estimated at 0.03 acres in 2009 and 0.003 acres in 2011.

Eight 22-inch diameter falsework piles were installed in the channel along the north bank in 2010. The piles had a total impact area of 21 ft² (0.000482 acres); they were removed in 2011.

The table below shows the individual area of impact of each location by year, as well as the total area impacted each year of in-channel construction.

Location	2009 (acres)	2010 (acres)	2011 (acres)	2012 (acres)
South bank access and staging	0.13	0.13	0.32	0.32
North bank access and staging			0.05	0.05
Falsework piles		0.000482		
FEZ structures	0.03		0.003	
<i>Annual Total</i>	0.16	0.13	0.37	0.37
<i>Total for entire project</i>				1.03

Stream Channel Mitigation

Both NOAA Fisheries and the CA Dept of Fish & Game consider the removal of the weir at Blue Lake a high priority for coho recovery within the Mad River watershed. To determine what amount of the Mad River stream channel would be restored by removal of the Blue Lake weir, the area of the channel that is currently occupied by the weir itself was estimated using manual measurements of digital imagery. A total of 5.9 acres of stream channel would be restored with removal of the weir, which is more than five times the 1.03 acres disturbed during replacement of the Mad River Bridges. The project will be completed in the summer of 2013. Details on the removal can be found in the attached application for the Fisheries Restoration Grant Program managed by CA Fish & Game (Attachment D).

Caltrans is proposing to mitigate for both fish losses and channel impacts by funding this project. Fish production will be increased as a much larger percentage of the population gains access to habitat above the weir. Calculations of fish increases are presented in the Long Term Compensatory Fisheries Mitigation Plan.

Attachment A

Mad River Bridges Replacement On-Site Wetland and Riparian Mitigation and Monitoring Plan



**Mad River Bridges Replacement, Humboldt County
Between Arcata and McKinleyville
On State Route 101
01-HUM-101-PM 89.1/90.4
Township 6N, Range 1E, W ½ of Section 8
01-296101**

November, 2007

Revised June, 2008
(as per Coastal Commission direction,
Invasive Species Eradication language, page 11)



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Attachments

- Attachment 1. Mad River Bridges Replacement Project Planting Palette
- Attachment 2. Baseline Datasheets

PURPOSE OF COMPENSATORY MITIGATION PROJECT

Proposed construction of the Mad River Bridges Replacement Project is anticipated to require a four-year construction scenario and will result in permanent impacts to approximately 0.04 acre of United States Army Corps of Engineers (USACE) vegetation at the Mad River Bridges site, as well as temporary impacts of approximately 0.02 acre. Also, up to 2.1 acre of temporary impacts to USACE jurisdictional other waters of the United States are anticipated to occur in each construction year. In the spring of 2007, a re-evaluation of less-than-three-parameter coastal wetlands was performed; temporary and permanent impacts to additional coastal wetlands (less-than-three-parameter wetland) of up to 1.82 acre, as a result of project construction, are now anticipated.

While all USACE jurisdictional impacts are proposed to be fully mitigated on site, off-site mitigation is proposed to satisfy the recommendations of the California Coastal Commission staff for a 4:1 mitigation ratio for the proposed project¹. A conceptual off-site wetland mitigation plan has been prepared. (See Old Samoa Conceptual Mitigation Plan, November 2007.)

This report fully describes the on-site portion of the Mad River Bridges wetland mitigation package. The proposed wetland creation design will utilize an area of 0.34 acres to create a minimum 0.04-acre USACE wetland and 0.28-acre less-than-three parameter (coastal) wetland. Also, up to 1.72 acres of riparian restoration will be accomplished on site post project construction. See On-Site Wetland and Riparian Mitigation mapping, attached.

The proposed habitat restoration has been modeled from a pre-construction baseline vegetation sampling of existing wetland and riparian areas within the project area. Vegetation sampling was conducted in the spring of 2007. Habitat types consist of Freshwater Marsh² and Red Alder/Black Cottonwood Riparian Forest. (Vegetation types are based on the California Department of Fish and Game, Natural Diversity Database Natural Communities List, 2003.) Under the existing bridges, riparian

¹ An additional, approximate 5.4 acres of off-site coastal wetland credits are anticipated to be necessary. Of the anticipated 5.4 acres of coastal wetland mitigation needed, 0.24 acre is proposed as a 4:1 mitigation for the combined permanent and temporary impacts to approximately 0.06 acre of less-than-three parameter wetland that cannot be mitigated on-site. The remaining 5.16 acres of off-site mitigation (in combination with the 1.72 acres of riparian restoration to be accomplished on-site at Mad River bridges) will facilitate a 4:1 mitigation ratio for the combined total permanent and temporary impacts to riparian vegetation of 1.72 acres. It is proposed to utilize the Old Samoa Parcel on SR 255, to satisfy all off-site coastal wetland mitigation necessary for the proposed project.

² Freshwater Marsh is designated within the California Department of Fish and Game, Natural Diversity Database as a sensitive vegetation type. However, the area of Freshwater Marsh to be affected by the project is neither extensive nor of high quality due to disturbance from roadway development and on-going maintenance, as well as other human induced factors.

vegetation is comprised almost exclusively riparian understory species due to height restrictions and past bridge construction clearing. Further, within the project area's less-than-three parameter wetlands, non-native wetland species are predominant as a result of on-going agricultural and rural residential development.

PROJECT REQUIRING MITIGATION

Location

The Federal Highway Administration (FHWA) and the California Department of Transportation (Caltrans) are proposing replacement of the Mad River Bridges on State Route 101 in Humboldt County. The proposed project is located between the towns of Arcata and McKinleyville on State Route (SR) 101, between postmiles (PM) 89.1/90.4 (see Exhibits 1 and 2, pages 19 and 20).

As described in the Summary Wetland Report prepared for the project (September 2005), Caltrans performed wetland delineation within the project study area. Verification of the Caltrans mapped jurisdictional boundaries was received from the USACE (File #283960N). Additionally, a supplemental delineation of less-than-three parameter wetlands has been performed (Mad River Bridges Supplemental Coastal Wetland Delineation, July 2007). See attached Vegetation Mapping and USACE Verification Mapping.

Project Summary

Caltrans has determined that the Mad River Bridges are structurally deficient in that neither the northbound nor southbound bridge meet current scour, seismic or geometric guidelines. Replacement of the structures is proposed to prevent further degradation of the bridges and to increase highway safety in the area. In addition to replacement of the bridges, modifications will be required to on-ramps and off-ramps. The project site is an area of approximately 20 acres. The project is expected to begin construction in 2008; a four-year construction scenario is anticipated.

The project requires construction within the Mad River itself, as well as adjacent riparian areas, wetlands and uplands. Because of the project's anticipated four-year construction scenario, impacts have been tabulated by year of construction impact, in an effort to articulate the extent of temporal impacts to jurisdictional resources due to project construction. See tables 1 and 2 (pages 7-8).

Site Characteristics

The project site is within the coastal floodplain, adjacent to the marine terraces of McKinleyville. The Mad River bridges span the Mad River approximately two miles

upstream of the river's terminus at the Pacific Ocean. In this section of rural highway, much of the landscape has been developed for agriculture and rural residential housing, with inclusions of commercial land use. The greater project vicinity has been extensively manipulated such that natural vegetation and habitat types have become extirpated or fragmented. Within the project area, the predominate vegetation type is Non-native Grassland which is actively managed for livestock grazing and haying. There are secondary vegetation types of Red Alder Riparian Forest interfacing with Black Cottonwood Riparian Forest along the Mad River riparian corridor, and Coastal Freshwater Marsh in low-gradient areas (such as ditches and swales).

Natural waters, which occur on-site, outside the Mad River itself, originate in the northeast project quadrant, in the McKinleyville bluff. These waters seep out of the hill slope and are then picked up in roadside ditches running along Central Avenue and Route 200. The waters are then carried via corrugated metal pipes (CMP's) under Central Avenue and Route 200, to outlet south of the Route 101/Route 200 intersection. Since the topography is flat, emergent wetlands have formed within engineered ditches at the CMP outlets. (Emergent wetlands at the site are classified by the Cowardin system as Riverine Lower Perennial Emergent Persistent.)

The emergent wetlands are dominated by Pacific water-parsley (*Oenanthe sarmentosa*) and small-flowered bulrush (*Scirpus microcarpus*). Adjacent to the ditches is a less-than-three-parameter coastal wetland that exhibits exotic vegetation as the dominant species such as velvet grass (*Holcus lanatus*), creeping buttercup (*Ranunculus repens*), and Himalayan blackberry (*Rubus armeniacus*, formerly *discolor*). Waters exiting the emergent wetland are conveyed in a straight u-shaped ditch to outlet onto the north bank of the Mad River.

Because the wetlands are situated within the working highway right-of-way, the majority of emergent wetland (Freshwater Marsh) and less-than-three-parameter wetland within the project footprint are subject to a mowing maintenance regime. However, the extant wetlands do provide for the following functions and values: flood flow attenuation and storage; sediment retention and water filtration benefits; ground water replenishment, and beneficial habitats for birds and small mammals.

A well-developed riparian corridor exists adjacent to the river, which is predominately vegetated by red alder (*Alnus rubra*), Hooker's willow (*Salix hookeriana*), and Pacific willow (*Salix lucida* ssp. *lasiandra*). A few mature black cottonwood trees (*Populus balsamifera* ssp. *trichocarpa*) and Oregon ash (*Fraxinus latifolia*) exist up and downstream of the existing bridges. The majority of riparian vegetation underneath the existing bridges is comprised of low-growing, shade-tolerant shrubs and herbs. Native species predominate under the existing bridges at the south bank (thimbleberry, [*Rubus parviflorus*], figwort [*Scrophularia californica*], stinging nettle [*Urtica dioica*]), while non-native species are predominate under the existing bridges on the north bank (velvet grass, Himalayan blackberry). The riparian corridor is a component of designated

critical habitat for the Southern Oregon/Northern California Coast ESU coho (*Oncorhynchus kisutch*), as well as the California Coastal ESU Chinook (*O. tshawytscha*) and Northern California ESU steelhead (*O. mykiss*).

MITIGATION DESIGN

As mitigation for impacts to USACE wetlands and additional coastal wetlands affected in Year 4 of project construction, the project proposes to restore self-sustaining wetland within the project footprint, at the northeast project quadrant, adjacent to existing waters mapped as Water A (see Vegetation Mapping and Exhibit 5, Wetland Layout and Typical Cross Section). Construction of the new bridges will be just west of the existing bridge structures, requiring a new alignment of roadway at the bridge on and off-ramps. In the northeast project quadrant, portions of the old alignment will be obliterated and approximately 11,000 cubic yards of fill material will be excavated and removed. The existing fill slope is dominated by non-native and non-regional native species (Himalayan blackberry and Monterey pine [*Pinus radiata*] respectively). Excavation of the fill slope will facilitate a footprint of up to 0.34 acres available for wetland creation.

Natural hydrology for the constructed wetlands is available on-site by realigning the waters currently conveyed in the straight u-shaped ditch (Water A) into a much wider channel area of approximately 0.34 acres. Design elevation for the newly constructed outlet of waters (conveyed under the proposed pedestrian path) will mimic the flow line of the adjacent, u-shaped ditch. In an effort to increase wetland habitat diversity, over a distance of a 100' run, elevation will gradually drop 12", creating a low-gradient ponded area. Wetland design will allow Water A to function as an overflow channel.

Wetland design will allow waters to remain on site longer, increasing wetland area, as well as the function and value of existing waters. These waters (originating in the bluffs above the site, but also including some roadside runoff) are mostly ephemeral, but some water does flow year-round. It is anticipated that a minimum 0.04 acres of emergent wetland will form in the creation area, as well as a minimum 0.28 acres of additional less-than-three-parameter coastal wetland. The first 16 inches of wetland topsoils (wetland soil profiles indicate a topsoil layer of greater than 12 inches) will be salvaged from the area at the north end of the proposed pedestrian path and stockpiled for use in the restored area.

The project proposes to restore 1.72 acres of riparian vegetation, both under, as well as adjacent to, the new bridge structures. Low growing and shade tolerant species that can tolerate a slight rain shadow effect from the overhead bridge decks will be utilized in revegetation under the new bridge structures. See Exhibit 6, On-Site Wetland and Riparian Restoration Mapping.

**Table 1.) Years One to Three: Mad River Bridges Project Construction
Adverse Impacts to Jurisdictional Wetlands/Waters and Proposed Mitigation
(Units given in acres).**

Identifier (See attached Impact Mapping and Surface Water Flow Diversion)	Temporary Impact	Permanent Impact	Proposed Mitigation
USACE Jurisdictional Wetlands and other Waters of the US			
Water C (scour pool at existing pier footing)		0.02	New scour feature will be constructed downstream of existing.
Various Impacts to River Channel in Every Year	2.1		None.
Total	2.1	0.0³	Construct new scour feature⁴.
Additional Coastal (<3 parameter) Wetlands			
Polygon 1, 21 and 24 (riparian)		0.35	Restoration on-site 1:1 post impact, and mitigate off-site 3:1.
Polygon 2 (<3 parameter wetland)		0.01	Mitigate off-site at 4:1.
Polygon 34, 35 and 16 (<3 parameter wetland)	0.05 ⁵		"
Polygon 17, 18, 22, 23, 27, 36, 37 and 38 (riparian)	0.55		Restoration on-site 1:1 post impact, and mitigate off-site 3:1.
Polygon 19 and 26 (non-woody riparian)	0.22		"
Polygon 20 and 25 (non-woody riparian)		0.11	"
Polygon 28, 29, 30, 31, 32 and 33 (riparian)		0.43	"
Total	0.82	0.90	<Three parameter wetland mitigation OFF-SITE = 0.24 acre; Riparian restoration ON-SITE = 1.72 acres, and Riparian mitigation OFF- SITE = 5.16 acres.

³ The proposed new bridge structures will result in a decrease of permanent fill within the river of 0.06 acre (versus the existing structures). Therefore, the project will result in no permanent loss to waters of the US.

⁴ No mitigation is proposed for temporary impacts to Waters of the US, or for 0.01 acres permanent impact to Waters of the US.

⁵ Coastal Commission staff has stated that temporary impacts lasting greater than one year should be mitigated at the same rate as permanent impacts (a 4:1 ratio).

Table 2.) Year Four: Mad River Bridges Project Construction Adverse Impacts to Jurisdictional Wetlands/Waters and Proposed Mitigation
(Units given in acres).

Identifier (See attached Impact Mapping)	Temporary Impact	Permanent Impact	Proposed Mitigation
USACE Jurisdictional Wetlands and other Waters			
Polygon 4 (emergent persistent)		0.04	On-site USACE wetland creation at 1:1, and on-site less-than-three-parameter wetland creation at 3:1. ⁶
Polygon 3 and 7 (emergent persistent)	0.02		Restore on-site 1:1 (one season impact; area will immediately re-establish).
Various Impacts to River Channel in Every Year	2.1		None. ⁷
Total	2.12	0.04	USACE On-site wetland creation = 0.04 acre And <three parameter wetland creation = 0.12 acre
Additional Coastal (<3 parameter) Wetlands			
Polygon 5 and 6 (<three parameter wetland)		0.03	On-site wetland creation at 4:1 (see footnote 5).
Polygon 8 (riparian)	0.01		Restore on-site 1:1 (one season impact; area will immediately re-establish).
Polygon 9 and 11 (non-woody riparian)	0.05		"
Polygon 10 (non-woody riparian)		0.01	Restoration on-site 1:1 post impact, and mitigate off-site 3:1.
Total	0.06	0.04	Additional Coastal On-site wetland creation = 0.16 acre.

⁶ Wetland impacts associated with Year Four construction could be fully mitigated on-site at a 1:1 ratio (USACE has approved this), however Caltrans anticipates a total 4:1 ratio will be required per Coastal Commission staff review.

⁷ No mitigation is proposed for temporary impacts to Waters of the US.

No mitigation is proposed for temporary project impacts to other waters of the US. Impacts to waters of the US, of up to 2.1 acres, are likely to occur in each year of project construction (See Surface Water Flow Diversion Mapping). These impacts are associated with channel dewatering for construction (within cofferdams), temporary construction access within the river bar, construction of bridge false work, a possible low-water crossing and a proposed sediment basin.

Proposed Compensation Ratios for Created and Restored Habitats

Tables 1 and 2 (pages 7 and 8) identify proposed compensation ratios for both on-site and off-site mitigation for impacts to jurisdictional resources associated with the construction of the Mad River Bridges Replacement.

IMPLEMENTATION PLAN

Site Preparation

Wetland Creation

As part of the demolition of the existing northbound bridge, the old roadway conveying northbound traffic off the structure and onto Central Avenue/Route 200 will be abandoned and obliterated. Fill material will be removed to facilitate wetland creation. The extant riparian vegetation, along the u-shaped ditch, adjacent to the wetland creation area, will continue to be protected in place through the period of site preparation. Stockpiled wetland soils from the area of the proposed pedestrian path will be evenly distributed within the creation area and the wetland basin will be top-dressed with native compost and/or other commercially available, weed-free, organic material.

The area immediately surrounding the wetland basin will be seeded and mulched for erosion control and fenced to exclude cattle. The seed mix will be specified to be weed-free and comprised of regionally appropriate native grasses and/or ephemeral non-native grasses (e.g. cereal grasses). The contractor for the bridges replacement project will be responsible for the erosion control and preparing the wetland creation area for planting.

Riparian Restoration

The ground under the existing, to-be-demolished bridges and the area under the proposed bridges will be ripped to a depth of 18 inches (the areas are likely to be compacted post-project construction). Soil ripping will not occur within 30' landward from the river's top-of-bank. Native compost and/or other commercially available, weed-free, organic material will then be incorporated into the soil as an amendment in preparation for planting. The area will be seeded and mulched for erosion control and fenced to exclude cattle. The seed mix will be specified to be weed-free and comprised of regionally appropriate grasses and/or ephemeral non-native grasses. The contractor

for the bridges replacement project will be responsible for the erosion control and preparing the riparian restoration area for planting.

Restoration Plan

After the proposed bridgework, roadway, and necessary slope excavation have been completed, the new wetland area will be planted and all disturbed riparian areas will be revegetated. Plantings in the wetland creation area will transition by species, as dictated by topography, from emergent wetland species to mesic riparian species. Plantings within the riparian area will transition by species, as dictated by both topography (willows just above the annual high water channel and larger riparian trees further up on the banks) and site specific conditions (e.g. under new bridge deck). The larger riparian trees such as red alder, black cottonwood and Oregon ash will be companion planted with riparian shrubs to ameliorate the open exposure and facilitate development of mature riparian vegetation structure.

Native vascular plant species identified for revegetation use were observed growing in or adjacent to the project site within their respective vegetation types. (See attached *Mad River Bridges Replacement Project Planting Palette*).

In an effort to blend with the surrounding landscape, the planting design will consist of species grouped in a natural manner that mimics adjacent native vegetative types and cover. Plantings will be spaced an average of 14 feet on-center for large trees, ten to eight feet on-center for small trees and shrubs, and four feet-on-center for areas planted with herbaceous plants. Container plant material will be specified to have been purchased from native plant nurseries and propagated from coastal and regional appropriate stock. Willows cuttings will be taken in or adjacent to the project area and harvesting will be well dispersed across the population for genetic and sexual diversity with no more than 20% of stems removed from any individual willow.

Following installation, plants will immediately be deep watered (soils will be saturated beyond the first several inches). Watering will then occur twice a month during the period June through September, in the first and second years post-planting. Supplemental watering (water truck or hand watering) after two years post-planting may be performed as needed based on site specific conditions or yearly climatic variations. However, it is anticipated that after the second full year, plants should have established and be self-sustaining. Supplemental watering, post-plant establishment is not recommended for native plants that need to acclimate to natural site conditions. Replaced plant material will be labeled with the month and year of replanting so that replaced plantings will have their watering start at year one in accordance with their planting date.

The majority of water for use during the plant establishment period is proposed to be drafted from the Mad River via a small fire pump (66.0 gal/min.) and hoses. Water

drafting for plant watering will occur between June 15 to October 15 and will include the following conditions:

1. No more than 1 cubic yard of stream gravel and/or cobble will be displaced with hand tools, in order to deepen an area in the active channel for drafting. The pool will be back-filled immediately when either there is the possibility of trapping fish during low flows or at the conclusion of yearly drafting operations.
2. Bypass flows in the Mad River shall remain at 2.0 cubic feet per second (CFS).
3. Diversion rate shall not exceed 10 percent of the above surface flow or pool volume. A pump rate of 66.0 gal/min would require less than 0.22 CFS flow to exceed 10 percent of the above surface flow from the Mad River (unlikely impact).
4. The intake hose will be wire mesh screened with round/square openings not to exceed 3/32 inches in diameter.
5. A screen area of at least 1.8 square feet will be utilized to prevent the intake approach velocity from exceeding 0.33 FPS. This would be accomplished by a custom screen on the intake or by utilizing a screened spring box from which drafting would occur.

The water drafting activity and proposed conditions will be included in the project's DFG notification for a Lake or Streambed Alteration Agreement (Fish and Game Code Section 1600 et. seq.).

Invasive Species Eradication

In coordination with the planting effort, invasive non-native species, rated as a High or Moderate threat (List A/List B) in California by the Invasive Plant Council's California Invasive Plant Inventory, will be eradicated and/or controlled. Weed control will be conducted in the spring and fall through-out the monitoring period to facilitate native species establishment and avoid weed infestations in the revegetated areas. Physical control methods (hand pulling and/or use of hand tools) will be utilized and no application of chemicals will be authorized. Weed control shall continue until the California Coastal Commission Executive Director has determined that final success criteria and revegetation performance have been fully achieved.

Himalayan blackberry was found widely distributed on the project site. California Invasive Plant Council (Cal-IPC) California Invasive Plant Inventory has assigned Himalayan blackberry a threat category of high with "A" (severe) ratings in its invasiveness, environmental impact and California distribution. Site preparation (removal of fill and grading) will eliminate most of the Himalayan blackberry in the project area. Physical removal and monitoring will be utilized throughout the mitigation monitoring period to control the spread of Himalayan blackberry into the planted areas.

Small populations of periwinkle (*Vinca major*), yellow water iris (*Iris pseudacorus*) and English ivy (*Hedera helix*) were also found within the project limits. Cal-IPC has assigned English ivy a threat category of high with "A" (severe) ratings in its invasiveness, environmental impact and California distribution. Periwinkle has a Cal-IPC threat category of moderate with "B" (moderate) ratings in its invasiveness, environmental impact and California distribution. Yellow water iris has a Cal-IPC threat category of limited with "B" (moderate) rating in its invasiveness, and "C" (limited) rating in its environmental impact and California distribution. Periwinkle was found adjacent to Route 200 and along Central Avenue. Yellow iris was found within the wetland at the northeast project quadrant, while English ivy was found within a coast redwood (*Sequoia sempervirens*) stand adjacent to the same wetland area.

Portions of this iris population will be destroyed when the north end of the pedestrian path is constructed. Some invasive plant root or seed material may be present in the salvaged wetland topsoils. During the monitoring period, physical removal methods will be employed to eradicate any remaining or subsequently expressed iris, as well as the periwinkle and ivy.

Implementation Schedule

Site restoration planting will begin after completion of all bridgework, drainage work and roadway work, in early 2012⁸ (depending on potential winter weather delays, mechanical breakdowns, etc...). Proposed plantings are likely to be completed within several weeks; planting will occur in early spring (February or March) to avoid impacts from potential winter flood events. Monitoring of the success of the planting and weed eradication will begin one year after the site restoration is implemented.

Initial site planting, watering, and invasive plant eradication/control is likely to be conducted under contract with the California Conservation Corps, and will be overseen by qualified Caltrans personnel (either a Caltrans Biologist and/or Landscape Architect and/or Revegetation Specialist).

QUALITATIVE MONITORING/SUCCESS CRITERIA

The monitoring goal is to ensure that wetland creation and riparian restoration goals and management objectives are met, and to provide a mechanism for corrective action if the goals and objectives are not being met. This goal will be evaluated through census or quantitative sampling monitoring. Census monitoring will be used for small and/or distinct areas that lend themselves to complete censusing, for example areas equal to or less than 0.25 acre. Quantitative sampling monitoring will be used for larger areas that do not lend themselves to a complete census and require sampling. Monitoring will

⁸ Note: site plantings will occur after the close of the main construction contract due to potential safety and liability concerns.

characterize extant conditions in the field, and data collection will be reproducible and collected in a consistent manner (e.g. field sampling forms and cover percent visual charts).

Success criteria for monitoring have been developed for the vegetation types impacted by project activities. Success criteria are based on vegetation baseline data and revegetation management objectives. The objectives utilized vegetation baseline data to determine native plant diversity, distribution, and cover of the impacted vegetation types. Vegetation baseline data was collected within the project area in 2007. (Baseline datasheets are attached.)

Revegetation Goals and Monitoring Objectives

The project revegetation goal is to restore a self-sustaining native vegetation cover, appropriate to the vegetation type, in sensitive habitat areas that have been disturbed by project construction. It is likely given the adjacent pasture and rural development that a non-native component will always be present at some level, so revegetation goals will be for a dominant native vegetation cover. The monitoring objectives are:

- 1.) Ensure that revegetation goals are met (monitor and provide a mechanism for corrective action if the objectives are not being met).
- 2.) Conditions extant in the field are represented by the data; such that the monitoring effort results in representative, accurate, and complete data.
- 3.) Data collection is reproducible and collected in a consistent manner (such as field sampling forms and vegetation cover percent visual charts).

Success Criteria

Success criteria will differ based on revegetation objectives as well as vegetation type and stratum due to natural variation in species composition, cover and diversity. Revegetation objectives and success criteria were developed for existing stratum covers greater or equal to 10 percent for all targeted vegetation types. See Table 3, page 15.

Revegetation Objective (change/trend): Increase relative canopy cover of viable⁹ native plants in all vegetation types to target cover percentages as listed in Table 3, by year five, in areas disturbed by project activities. Relative canopy cover (proportional cover of one species to total vegetation cover) will be utilized due to the extended time (10 to 20 years) needed to meet pre-project absolute canopy cover of a well established vegetation type. Initially, revegetated areas will be more open in absolute canopy cover (vertical projection of perimeter of species canopy including gaps relative to ground surface) until

⁹ In this circumstance, viable will be defined as greater than 50% green (live) material.

the plant material matures and fills in, and relative cover will facilitate an assessment of vegetation cover under these conditions. In addition, establish specific levels of species composition and richness in each vegetation type stratum where applicable.

Sample Objective: 90% confidence to detect increase in native plant cover by vegetation type accepting a 10% false-change error rate.

Monitoring Methods

Monitoring methods will be census or quantitative sampling monitoring, each coupled with a qualitative component of permanent landscape photo points.

Census monitoring will assess relative canopy cover of individual or discrete mats of each species utilizing cover percent visual charts. A grid may be applied to the project area and each cell averaged to facilitate coverage estimates and ensure complete coverage.

Quantitative Sampling Design will utilize a systematic sampling design, and independent-sample one-tailed t-test statistical analysis. The sampling unit will be independently placed quadrats, or point or line intercepts along transects positioned without bias (random start and systematic placement) off of a baseline transect (based on pages 121-126, Elzinga, Salzer and Willoughby 1998).¹⁰ Sampling unit will record relative canopy cover of individual or discrete mats of each species. Sampling unit size and shape will be dependent on species of interest, spatial distribution of species, and variability detected between plots. Sampling unit size/shape, and number will be determined through pilot study data collected at the start of initial monitoring activities. Pilot study data will be used to calculate the coefficient of variation (relative measure of variability), and the design with the smallest value will be chosen and if similar the easiest to implement (pages 459-461, Elzinga, Salzer and Willoughby 1998).

At least one reproducible landscape photo point will be established within each distinct revegetation area in year one, three and five to document as-built conditions and vegetation cover changes.

¹⁰ Elzinga, C.L., D. W. Salzer, and J.W. Willoughby. 1998. *Measuring and Monitoring Plant Populations*. U.S. Bureau of Land Management. Denver, CO.

Table 3.) Success Criteria by Vegetation Type and Stratum.

Vegetation Type/Stratum	Baseline Cover ¹¹	Target Cover ¹²	Species Richness	Species Composition
Red Alder/Black Cottonwood Riparian				
Tree	71%	>60%	At least 4 of the 6 species representative of the vegetation type and stratum.	No single species will constitute >80% of the total coverage. Several tree species dominate and naturally constitute a high percent of composition.
Shrub	78%	>60%	At least 4 of the 6 species representative of the vegetation type and stratum.	No single species will constitute >60% of the total coverage. Several shrub species dominate and naturally constitute a high percent of composition.
Herb	<10%	N/A	N/A	N/A
Riparian Under Bridge Decks				
Shrub	60 – 80 %	>50%	At least 4 of the 6 species representative of the vegetation type and stratum.	No single species will constitute >60% of the total coverage. Several shrub species dominate and naturally constitute a high percent of composition.
Herb	10%	10%	At least 4 of the 6 species representative of the vegetation type and stratum.	No single species will constitute >60% of the total coverage. Several herbaceous species dominate and naturally constitute a high percent of composition.
Coastal Freshwater Marsh				
Herb	95%	>80%	At least 4 of the 7 species representative of the vegetation type and stratum.	No single species will constitute >40% of the total coverage.

¹¹ Absolute canopy cover.

¹² Relative canopy cover.

Monitoring Schedule

Census and/or quantitative sampling will be conducted in year one, three and five after the site restoration is implemented. Monitoring will start the first year after revegetation activities.

REMEDIAL ACTIONS/ADAPTIVE MANAGEMENT

If the restoration site is not meeting its success criteria due to low plant survival and/or coverage, plants will be added or replaced during the early spring. Natural recruitment or transplanting of materials collected on-site, but outside the restoration effort, may be utilized to facilitate native vegetation recovery. Some level of natural recruitment is likely to occur on site, and planting efforts will work in conjunction with any volunteer native plant expression and colonization.

If any particular planted species within the restoration areas demonstrates a failure-to-thrive trend (less than 50% green material) then other appropriate native species, as deemed appropriate by a Caltrans Biologist or Revegetation Specialist, may be substituted within the planted area.

MONITORING REPORTS

As-Built Report

Within 30 days of the completed installation of the mitigation planting and revegetation, a report will be sent to the USACE, the California Coastal Commission and the California Department of Fish and Game (collectively Agencies). This report will describe field implementation of the proposed plantings, including any installation problems encountered and resolutions. The as-built report will describe what species were planted, where they were planted, what type of material was planted and to what specifications. Landscape photos of the planting implementation (by vegetation type) will be included in the report.

Remedial or adaptive management measures may become evident and necessary during monitoring. If these measures modify the initial species planted or coverage then the as-built plan will be revised to reflect the new baseline. As-built plans will be revised to show specifically how the revegetation plan was modified, and then submitted within 60 days of any adaptive management measures initiated.

Interim Monitoring Reports

Interim monitoring reports will be prepared by the Caltrans Biologist or Revegetation Specialist for review by the Agencies in year one and three post restoration

implementation. Interim monitoring reports will be submitted to the Agencies by December 31st in the monitoring year. Submissions will include the following: Jurisdictional Agency file number(s); name(s) of person who prepared report and who performed the monitoring; monitoring dates, methodology and a data summary.

The interim monitoring report will describe the previous years monitoring results and any corrective actions that were taken, and will evaluate and summarize the data for the current year compared to previous years. The report will specify if the success criteria are being achieved, and if not, any recommended remedial/adaptive management measures. Photo documentation will be included. The first interim monitoring report will be submitted after the restoration area has experienced one full growing season.

A wetland delineation will be conducted by Caltrans prior to the final year's monitoring report to evaluate the success of the on-site wetland creation goal. To be deemed successful a minimum 0.04 acres USACE jurisdiction wetland and a further minimum 0.28 of additional coastal wetland must be present in the creation area. Results of the delineation will be submitted to the Agencies.

FINAL REPORT

A final report will be submitted to the Agencies at the end of the final performance-monitoring period (five years). The report will evaluate how successful the restoration was with regard to riparian revegetation and wetland creation success criteria and objectives. The report will include a compilation of all monitoring data, the as-built report (including revisions) and photo point documentation.

POTENTIAL CONTINGENCY MEASURES

If the final report indicates that the mitigation and revegetation plan has failed to achieve its goals, in part or wholly, based on the plan's defined goals, objectives and success criteria then the cause of the mitigation failure will be identified. This may require re-evaluation of the site conditions as well as development of remedial/adaptive management measures in consultation with the Agencies.

MAINTENANCE

In addition to the proposed monitoring schedule, the overall project site will be inspected by Caltrans staff at least twice annually during the growing season for the period of the mitigation monitoring to assess the following: presence/absence of invasive species; erosion; general plant population health, vandalism, and browse damage.

COMPLETION OF MITIGATION RESPONSIBILITIES

Completion of the on-site mitigation will be demonstrated upon submittal of the final report to the Agencies, documenting achievement of the plan's success criteria. It is anticipated that the final report will be produced in December of 2017. Final compliance will not be accomplished until the Agencies are satisfied, per relevant conditions and requirements.

LONG-TERM MANAGEMENT

Caltrans will maintain the wetland creation area as an Environmentally Sensitive Area in perpetuity. The area will be designated as an Environmentally Sensitive Area and added to the District 1 Caltrans Maintenance Environmentally Sensitive Area (ESA) database. This database is utilized by the Caltrans Maintenance Department to guide activities within sensitive resource areas. The wetland mitigation area will be identified as to location and resource type and prescribed to have no disturbance activities allowed. The mitigation area will be added to the District 1 ESA database at time of wetland construction. Fencing to exclude cattle will be maintained by Caltrans in working condition.

The planted riparian areas within state right-of-way, outside the wetland creation area, will continue to be subject to management under the guidance of the California Environmental Quality Act. Fencing to exclude cattle will be maintained by Caltrans in working condition.

Attachment B

Summary of the Wetland Restoration at the Old Samoa Mitigation Parcel

November 28, 2012

In the winter and spring of 2010, two acres of riparian fringe habitat were planted along the northern boundary of the Samoa Parcel.

Planting stock was sourced from the Humboldt Bay area and custom grown by the Humboldt Fish Action Council Native Plant Nursery. Utilizing the California Conservation Crew as labor, under the direction of a Caltrans botanist, the following species were installed as container plants: *Alnus rubra* (red alder), *Lonicera involucrata* var. *ledebourii* (black twinberry), *Malvus fusca* (Oregon crabapple), *Morella californica* (wax myrtle), *Picea sitchensis* (Sitka spruce), *Rhamnus purshiana* (cascara), *Ribes sanguineum* var. *glutinosum* (pink-flowering current) and *Rosa nutkana* var. *nutkana* (Nootka rose). Additionally, cuttings of *Salix hookeriana* (Hooker's willow) and *S. sitchensis* (Sitka willow) were installed.

Plantings were spaced approximately 8-10 feet on center, and the planted area was set back from State Route 255 a minimum 50 feet.

Supplemental watering was performed for the first two years of plant establishment (summers of 2010, 2011).

In June of 2011, survivorship was monitored and calculated at 77%. Visual monitoring of general health was performed in 2012, the area is performing well and continues on a positive trend.

**Report on the Function of Wetlands at the Elk River
Mitigation Site
Prepared pursuant to Coastal Development Permit 1-02-016
Cole Avenue Safety Project**

October 2002

Prepared by:

Signature on File

Susan Taylor
Associate Biologist
Caltrans District 1, Eureka

Introduction

This report includes observations at the Elk River mitigation site and is based on a vegetation survey made October 17, 2002. This report is prepared to satisfy requirements of Coastal Development Permit #1-02-016. Caltrans intends to use 0.25 acres of the mitigation site to mitigate for impacts to wetlands as a result of a Safety Project at Cole Avenue.

Results and Discussion

The vegetation analysis was based on observation of 34 one-meter quadrants. Transects were laid out at 200 foot intervals perpendicular to Route 101 and extended from the highway to the dikes. Along each transect, sampling stations were designated every 100 feet. This is a randomly selected grid and is not based on visual observations in the field.

At each quadrant location, all species present were listed. Each species was then assigned to a cover class according to the following chart.

<u>Class</u>	<u>Percent Cover</u>
1	0-5
2	6-25
3	26-50
4	51-75
5	76-95
6	96-100

In order to determine the percent of wetland vegetation verses non-wetland vegetation the species in the quadrants were given equal parts value. The species that were not indicated on the US Fish and Wildlife Service's National Indicator List were dropped. Twenty nine of the thirty four quadrants surveyed contained 100% wetland vegetation. The remaining five plots contained over 50% wetland vegetation. This demonstrates that the site is dominated by wetland vegetation.

The site is inundated by tides on average approximately 35 times per year. This figure does not include flooding related to rainfall. Additional inundation due to both rainfall and tides might result in inundation for an additional 5-10 days per year. These models indicate that the site maintains sufficient hydrology to function as a wetland. This is the second parameter used to demonstrate that the Elk River mitigation site functions as a wetland.

The soils at the Elk River mitigation site are hydric and can also be used as an indicator of wetland habitat on site. Prior to construction of Route 101 the area was tidally influenced. Hydric soils are native to the site and were present before the dikes were breached in an effort to restore the tidal marsh.

Monitoring reports were prepared annually from 1981 to 1985. These reports documented the formation of brackish marsh and showed that the breached dike functioned as it was intended. The vegetation analysis indicates increased dominance of salt tolerant species. In 1985 it was noted that salt marsh indicator species were absent from the mitigation site. These include cordgrass (*Spartina foliosa*), arrow grass (*Triglochin maritima*), and Jaumea, (*Jamumea carnososa*). The arrow grass and the Jaumea were identified in the 2002 survey. Jaumea had a low percent cover and was not present in the sample quadrants, but noted in between quadrants. The non-native Chilean cordgrass *Spartina densiflora* was present on the margins of the man-made canals throughout the mitigation bank. The total percent cover of the Chilean cordgrass is approximately one percent. It is likely that the percent cover will increase in the future.

Two halophytic species, salt rush (*Juncus lesueurii.*), and fat hen (*Atriplex patula*) continue to dominate at the mitigation site. Pickleweed (*Salicornia virginica*), another halophyte, is now a dominant species as well, with the greatest absolute frequency.

A total of 18 plant species were observed in the sample quadrants in 2002. Several of the species found at the site in 1985 were not present. This is likely for two reasons. The species absent are not halophytic. This demonstrates that the vegetation community has become more of a brackish marsh. The survey was conducted in October whereas previous surveys were conducted in July. Annual species may have been absent due to the timing of the survey.

Table 1 lists plant species observed within the quadrants. Table 2 shows frequency, mean cover class and the relative mean cover class of all species noted in the 2002 survey. There was one grass species that was not identified due to lack of flowering parts; it is named unknown 2. The Absolute Frequency equals the number of quadrants in which a particular species was found. The Relative Frequency is the Absolute Frequency divided by the total number of observations for all species multiplied by 100. The Median Cover is the number in the center of the row of cover classes for a particular species. The Relative Median cover was calculated by multiplying the median cover by the Relative Frequency of the species. Table 3 is a list of all animal species (or signs of the species) observed at the site on October 17, 2002.

The breached areas of the dike remain in stable condition and continue to function as intended. The Elk River Mitigation site provides wetland habitat for many species of plants and animals.

Table 1
Elk River Mitigation Site:
Plant Species observed in Sample Quadrants
October 17, 2002

<i>Achillea millefolium</i>	yarrow	FACU
<i>Angelica Hendersonii</i>	Angelica	not listed
<i>Aster chilensis</i>	common aster	FAC
<i>Atriplex patula</i>	fat hen	FACW
<i>Baccharis pilularis</i>	coyote brush	not listed
<i>Carex opnupta</i>	slough sedge	OBL
<i>Cotula coronopifolia</i>	brass buttons	FACW+
<i>Deschampsia caespitosa</i>	hairgrass	FACW
<i>Distichilis spicata var. stolonifera</i>	salt grass	FACW
<i>Grindelia stricta ssp. Blakei</i>	Humboldt Bay gum plant	not listed
<i>Holcus lanatus</i>	velvet grass	FAC
<i>Juncus lesueurii.</i>	salt rush	FACW
<i>Potentilla Ededei var. grandis</i>	Potentilla	not listed
<i>Rubus vitifolius</i>	blackberry	FACW
<i>Salicornia virginica</i>	pickleweed	OBL
<i>Spartina densiflora</i>	Chilean cordgrass	not listed
<i>Triglochin maritima</i>	arrow-grass	OBL

Indicator Categories:

OBL Obligate Wetland Occur almost always under natural conditions in wetlands.

FACW Facultative Wetlands. Usually occur in wetlands, but occasionally found in non-wetlands.

FAC Facultative. Equally likely to occur in wetlands or non-wetlands.

FACU Facultative Upland. Usually occur in non-wetlands.

Not listed = not found on the US Fish and Wildlife Service Indicator Species List.

Table 2
Data Table for 2002 Vegetation Analysis

Genus	Abs. Freq.	Relative Freq.	Median Cover Class	Relative Median Cover Class
<i>Achillea</i>	1	0.8	2	1.6
<i>Angelica</i>	1	0.8	1	0.8
<i>Aster</i>	6	4.5	2	9.0
<i>Atriplex</i>	19	14.3	2	28.6
<i>Baccharis</i>	6	4.5	3	13.5
<i>Carex</i>	2	1.5	3	4.5
<i>Cotula</i>	1	0.8	2	1.6
<i>Deschampsia</i>	12	9.0	2.5	22.5
<i>Distichilis</i>	14	10.5	3.5	36.8
<i>Grindelia</i>	10	7.5	1.5	11.3
<i>Holcus</i>	1	0.8	2	1.6
<i>Juncus</i>	22	16.5	3	49.5
<i>Potentilla</i>	4	3.0	2	6.0
<i>Rubus</i>	3	2.2	1	2.2
<i>Salicornia</i>	24	18.0	3	54.0
<i>Spartina</i>	1	0.8	2	1.6
<i>Triglochin</i>	4	3.0	2	6.0
<i>Unknown 2</i>	2	1.5	1.5	2.3
TOTALS	133	99.9	39	253.3

Table 3
Animal Species Observed at the Elk River Mitigation Site
October 17, 2002

<i>Ceryle alcyon</i>	Belted Kingfisher
<i>Corvus brachyrhynchos</i>	Common Crow
<i>Corvus corax</i>	Common Raven
<i>Cistothorus palustris</i>	Long-billed Marsh Wren
<i>Elanus leucurus</i>	White-tailed Kite
<i>Gallinago gallinago</i>	Common Snipe
<i>Lutra canadensis</i>	River Otter
<i>Melospiza melodia</i>	Song Sparrow
<i>Odocoileus hemionus</i>	Black-tailed Deer
<i>Phalacrocorax auritus</i>	Double-crested Cormorant
<i>Sylvilagus bachmani</i>	Brush Rabbit
<i>Sorex vagrans</i>	Vagrant Shrew

2011 FRGP Proposal Application Form

For DFG use only		
Proposal No.		Region
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section 1: Summary Information

1. Project type:	HB
2. Project title:	MAD RIVER WEIR REMOVAL PROJECT
3. Applicant name:	HUMBOLDT COUNTY RESOURCE CONSERVATION DISTRICT
4. Person authorized to sign grant agreement (Name and Title):	Donna Chambers, Executive Director
5. Contact person (Name and Title):	Donna Chambers, Executive Director
6. Mailing Address: Check if changed from previous applications <input type="checkbox"/>	5630 South Broadway
7. City, State, Zip:	Eureka, CA 95503
8. Telephone #: Check if changed from previous applications <input type="checkbox"/>	707-444-9708 x 117
9. Fax #:	707-442-7514
10. Email address:	<u>donnahcrcd@yahoo.com</u>
11. Type:	Public Agency <input checked="" type="checkbox"/> Nonprofit Organization <input type="checkbox"/> Indian Tribe <input type="checkbox"/>
12. Certified nonprofit organization:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Nonprofit Organization Number: _____
13. New grantee:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

14. Licensed Professional	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If Yes provide: Name: Glenn Hurlburt, P.E Affiliation: Caltrans North Region Design/Hydraulics District 1, Eureka CA Contact information: 707-444-2037 glenn_hurlburt@dot.ca.gov
15. Amount requested:	\$144,549.75
16. Total project cost:	\$294,549.75
17. Salmonid species benefited:	Coho <input checked="" type="checkbox"/> Steelhead <input type="checkbox"/> (Cutthroat <input type="checkbox"/> Chinook <input type="checkbox"/>)
18. Project objectives:	The Project will address CDFG recovery priorities through the removal of a failed weir. The project will remove a man-made barrier to improve fish passage and sediment transport and decrease hazardous conditions posed to recreational users of the Mad River in the area adjacent to California Department of Fish and Game's fish hatchery near Blue Lake, California.
19. Task number or reference: (only list one task)	MR-BL-10 Strategy for California Coho Salmon Treat High Priority Barriers to Coho Salmon Passage
20. Time frame:	June 1, 2012 – December 2012 Work will commence in the summer of 2012 and be completed in a single work season.
21. Stream:	Mad River
22. Tributary to:	Pacific Ocean
23. Watershed System:	Hydrologic Unit Code (HUC 8) - Mad-Redwood
24. County(ies):	Humboldt
25. Coastal Zone:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
26. Trinity River Basin:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

Section 2: Location Information

1. Township, Range, Section (T/R/S): and the 7.5 USGS <u>Quad map name</u>.	Township 6 North, Range 2 East Section 31 on the USGS 7.5 Korbelt Triangle
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2. Latitude, Longitude (in decimal degrees, Geographic, NAD83):	Latitude 40.51.14.58" N Longitude 123.59.22.83" W
3. Location description:	The proposed project area is located in the Mad River at river mile 12.13. It is adjacent to the California Department of Fish and Game fish hatchery near the town of Blue Lake in Humboldt County, California as shown on the attached vicinity map (page 24). The western edge of the weir is near the hatchery fish ladder. From that point it extends eastward 195 feet perpendicular to the Mad River.
4. Directions:	From Highway 101 take Highway 299 east to the Blue Lake exit. Turn right onto Chartin Rd, left onto Railroad Ave, and right onto Hatchery Rd. to the hatchery parking lot. Follow the signs to the handicap accessible pathway. The weir can be seen from the end of the handicap accessible pathway.

Section 3: Watershed Information:

All questions in this Section refer to the watershed named in Number 1 below.

1. Watershed name:	Mad River Watershed
2. Watershed area:	square miles = approximately 497
3. Watershed area directly affected by the proposed project:	percent = 50%
4. Land use statement:	The USDA Forest Service and Bureau of Land Management manage most of the upper one-third of the watershed. Private ownership in the watershed includes industrial timber lands (Green Diamond Resource Company, Sierra Pacific Industries, and Humboldt Redwood Company), smaller private nonindustrial timber and ranch lands, and rural residential properties. Land uses in the watershed include industrial and nonindustrial timber management, ranching and agriculture, gravel mining, urban and rural residential development, road infrastructure, and power and gas line operations. These land uses are not expected to change in the next ten years. Population in the Mad River watershed is expected to increase moderately and steadily, particularly in the Lower Mad River area. Public land areas are not expected to decrease nor increase dramatically in the near future.
5. Watershed ownership:	% Private: <u>69</u> % State: <u>1</u> % Federal <u>30</u>

6. Length of anadromous streams in watershed:	miles = 87.5
7. Watershed Plan(s):	California Department of Fish and Game. 2004. Recovery strategy for California coho salmon. Report to the California Fish and Game Commission. 594 pp. Copies/CDs available upon request from California Department of Fish and Game, Native Anadromous Fish and Watershed Branch, 1416 9th Street, Sacramento, CA 95814, or on-line: http://www.dfg.ca.gov/nafwb.cohorecovery
8. Background information	<p>The Mad River is a 4th order stream that drains approximately 497 square miles of the Coast Range Geomorphic Province. It flows for approximately 113 miles in a roughly northwest direction through Trinity County then Humboldt County and empties into the Pacific Ocean north of Humboldt Bay. The river is free-flowing for 85 percent of its length. Matthews Dam, owned by Humboldt Bay Municipal Water District, forms Ruth Reservoir which serves Eureka, Arcata, Blue Lake and numerous unincorporated communities in the area. The dam is located about one third of the way down the river from its source. Based on USGS data for the Mad River, average daily flow for July through September is estimated at 51 cfs.</p> <p>Several native Endangered Species Act (ESA) listed and nonlisted fish species currently inhabit the watershed including, but not limited to, Chinook and coho salmon, summer and winter-run steelhead, resident rainbow trout, coastal cutthroat trout, California roach, three-spine stickleback, riffle and prickly sculpins, Pacific lamprey, brook lamprey, and green sturgeon. Non-native fish species include brown bullhead, channel catfish, Sacramento sucker, largemouth bass, crappie, and bluegills. (<i>Mad River watershed assessment. 2010. Final report. Prepared by Stillwater Sciences, Arcata, California in association with Redwood Community Action Agency, and Natural Resources Management Corp. Eureka, California.</i>) Coho salmon enter the Mad River during November and spawn November, December and possibly through January (Zuspan et al. 2002). The coho salmon life history is quite rigid, with a relatively fixed three-year life cycle. Most spawners return to spawn at age three after spending 18 months in the ocean, but some sexually mature males (grilse or jacks) return after six months in the ocean. Generally, coho salmon enter Mad River sexually mature and migrate into small tributaries to spawn.</p> <p>The basin is about 100 miles in length and averages six miles wide. Elevations range from sea level at the mouth to 3,000 feet along the western ridge to 6,000 feet in the headwaters. Vegetation in the watershed is composed of early to late seral</p>

coniferous forests, hardwoods, and grasslands. Rainfall averages 40 inches along the coast to over 80 inches at the higher elevations. Principal tributaries to the Mad River include South Fork Mad River, North Fork Mad River, Barry Creek, Pilot Creek, Deer Creek, Bug Creek, Graham Creek, Blue Slide Creek, Boulder Creek, Maple Creek, Canõn Creek, Lindsey Creek, and Mill (Hall) Creek.

The Mad River watershed can be divided into three subwatershed areas (Upper, Middle and Lower) based on geomorphic characteristics. Resource-based economic activities (Timber, Ranching, and Gravel Mining) occurred historically throughout the watershed and continue today. Ranching and timber harvesting occur predominately in the upper portion of the watershed. Residential development has steadily expanded in the lower and middle areas of the watershed. Gravel mining operations are found in the lower reach of the watershed.

The proposed project is located in the Lower Mad River subwatershed which encompasses 226 square miles (45% of the basin) including the lower 37 miles of mainstem river channel. This section of the mainstem river channel has a gentle gradient of 12 feet per mile. The river enters a wide alluvial valley at Blue Lake. The lower Mad River watershed is the most densely populated, with many rural residents drafting domestic water from tributaries. Approximately seven miles upstream from Blue Lake are the remnants of Sweasey Dam. The dam was built in 1938 and subsequently removed in 1970 due to filling with sediment.

California Department of Fish and Game's Mad River Fish Hatchery is also found in this reach of the river. Construction on the hatchery started in 1969 and was completed in 1971. The California Wildlife Conservation Board constructed the hatchery to increase salmon and steelhead populations. For many years the hatchery raised salmon and steelhead from all over northern California. The hatchery also raised trout to be stocked in local lakes and lagoons, like Freshwater Lagoon, Ruth Lake, and Fish Lake.

Section 4: Project Objectives

1. List task information (for task listed in box 19 Section 1):

Information on the Mad River watershed states that barriers to coho salmon passage should be identified and removed (Recovery Strategy for California Coho Salmon). The plan assigns a SONCC

Task Level "D" and Task Priority Number "4" (MR-BL-10 D 4 Treat high priority barriers to coho salmon passage).

The proposed project will remove a reinforced 18 foot wide, one foot thick concrete slab that extends 195 feet across the Mad River. The slab has started to degrade, exposing the rebar. This structure is a low flow barrier to all salmonids and other fishes. Removal of this barrier achieves the goal identified in the task named above.

2. Need for the project:

The waters of the Mad River provide critical habitat for rare or endangered fish species, including 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. The concrete sill that was the foundation for the Mad River weir was built in the summer of 1989. The purpose of the weir was to direct Chinook salmon and steelhead into the fish ladder at the Mad River Hatchery. The weir structure was never effective in directing Chinook into the ladder and a weir has not been necessary to direct steelhead into the ladder. The concrete sill started to fail after the first high flows in the winter of 1989/1990 (N. Manji, personal communication). In 2002 staff from the Red Bluff Screen Shop attempted to demolish the sill. The structure proved too formidable for their equipment and the project was abandoned.

According to the Recovery Strategy for California Coho Salmon; "Artificial structures on streams fragment aquatic ecosystems by blocking or impeding migration and altering nutrient cycling patterns, streamflows, sediment transport, channel morphology, and stream-corridor species composition. This reduces available habitat, changes habitat conditions for anadromous salmonids, and reduces native biodiversity. Instream structures have the potential to, depending on conditions, either entirely or partially block fish from accessing upstream reaches and block critical habitat necessary for survival. Even if stream barriers are eventually negotiated by fish, the extra energy expended may result in their death prior to spawning or in reductions in viability of eggs and offspring. Barriers that increase the time required for migration can limit the distance adult fish are able to travel upstream before spawning, resulting in the crowding of redds in lower stream reaches and under-utilization of upstream habitat." Removing such barriers is identified in the plan as a priority task.

It is desirable to remove the structure for the following reasons:

- The sill is no longer required for hatchery operations. The sill and weir structure was not effective in diverting Chinook into the ladder and steelhead readily go into the ladder without the need for a weir. This is most likely due to the hatchery using well water to operate the hatchery and ladder.
- The sill is a low flow barrier to all salmonids and other fishes. In 2005 a green sturgeon was found trapped below the structure and had to be relocated (D. Free, personal communication).
- The sill is a safety hazard for boaters and swimmers.
- It is an artificial channel control that locally affects sediment transport.

3. Limiting factors to salmonids remediated by proposed project:	<input type="checkbox"/> Water quantity (lack of flow, diversions, runoff) <input type="checkbox"/> Water quality (temperature, chemistry, turbidity) <input type="checkbox"/> Riparian dysfunction (lack of shade, excessive nutrients, roughness, elements) <input type="checkbox"/> Excessive sediment yield (pool and gravel quality) <input type="checkbox"/> Spawning requirements (gravel, resting areas-pools) <input type="checkbox"/> Rearing requirements (velocity, lack of shelter, pools) <input type="checkbox"/> Estuary / lagoon issues (closure during migration periods) <input checked="" type="checkbox"/> Fish passage (emigration and immigration)
4. Limiting factor remediation:	Removing the weir would provide unimpeded fish passage for all fish during all life stages.

Section 5: Project Description

1. Detailed project description including all tasks to be performed:

ISSUE: In 1989 a 195 foot long weir was constructed in the Mad River, adjacent to the California Department of Fish and Game (DFG) fish hatchery near Blue Lake (river mile 12.3). The weir is clearly visible on the aerial map on page 28. According to DFG documents, the purpose of the weir was to divert Chinook salmon and steelhead into the ladder. The weir's concrete sill started to fail after the first high winter flows. Within a few years, the Department determined that the weir was not achieving its purpose. The weir was not needed to divert Steelhead into the fish ladder and the weir was not effective at diverting Chinook into the ladder. In 2002 there was an unsuccessful attempt to demolish the weir. The partial de-construction and subsequent water damage have exposed more of the internal rebar, posing a trapping hazard for fish and unsafe conditions for the public in this section of the Mad River. Removing the weir from the river will eliminate a man-made barrier to fish passage that also poses a hazard to the recreating public. The weir sill is an artificial channel control that locally affects sediment transport and is a low-flow barrier to all salmonids and other fishes within this reach of the river.

PROJECT OBJECTIVES: Improve fish passage and sediment transport by removing the failed weir.

PROJECT ELEMENTS:

CONTRACT MANAGEMENT, PROJECT COORDINATION AND OVERSIGHT: Humboldt County Resource Conservation District will provide management, coordination, project oversight and invoicing and reporting.

ACCESS: Humboldt County Resource Conservation District (HCRCD) has obtained a provisional access agreement from Green Diamond, the landowner adjacent to the eastern edge of the proposed project location. HCRCD proposes to coordinate with Green Diamond to utilize an existing access road on Green Diamond lands and to subcontract with a reputable local construction firm to construct an access point from that road approximately 75' to the river bar for ingress and egress during project activities. It is approximately 150'-250' from the gravel bar to the weir.

WATER DIVERSION: All work will be conducted during the low flow season with an expected work window of August 1 – September 15. Utilizing existing native materials, a coffer dam comprised of a gravel berm will be constructed upstream of the weir. This will force the channel to the right bank, isolating the work area. The channel will reconnect to the left bank live channel downstream, most likely with a trench. Due to the riverine environment additional dewatering is assumed and will be accomplished by the use of pumps. Best Management Practices will be applied to the management of water pumped from the work area to assure minimal impacts to water quality. HCRCD will work closely with DFG to screen and relocate fish.

WEIR REMOVAL (please refer to page 22 for plan drawings):

A) EXISTING WEIR CONSTRUCTION ELEMENTS:

1. Concrete Deck – The deck or “sill” of the weir is a reinforced concrete slab 195 feet long and 18 feet wide. The slab is one foot thick with a “same pour” concrete perimeter grade beam two feet wide and two feet thick. The slab is reinforced with two layers of steel grid fabricated from 5/8 inch diameter rebar on 10-inch centers.
2. Fish Ladder - From construction drawings, it appears that the concrete deck may be attached to the fish ladder but details of that connection are unknown. For this reason, the proposed project will leave an approximately 15' X 18' section of weir in place adjacent to the existing fish ladder. Please refer to page 23 for a longitudinal profile of the area provided to NOAA as part of monitoring Guynup Enterprises gravel mining operations. According to Margaret Tauzer of NOAA Fisheries, the low water surface will end up around 90 ft NAVD after removal of the weir and related channel adjustments. Tauzer concludes that since this is essentially what exists currently the ladder should continue to operate as it does now.
3. Steel Foundation Piles – The concrete slab is anchored to 48 steel H beams (piles) with 10-inch wide flanges that are 0.42-inches thick. The piles are embedded a minimum of 25 feet into native streambed material described as dense to very-dense, gray silty sand and gravel with occasional cobbles and boulders. In addition, the vertical piles are buttressed by 16 intermediate batter piles of the same size and embedment depth. The concrete slab is joined to each piling with two one inch diameter steel bars and the joint is entombed within the concrete of the grade beam.
4. Riprap Apron – Surrounding the weir on three sides is a six-foot thick rock protection (riprap) apron composed of two- to four-ton boulders. The design shows the riprap key to be seven feet wide and eight feet below the native streambed. The total length of apron is approximately 410 feet, and it is estimated to contain 1,800 cubic yards of riprap.

B) DEMOLITION AND DISPOSAL OF THE REINFORCED CONCRETE SLAB:

Approximately 130 cy of concrete rubble will need to be disposed of along with the steel "H" beams, anticipated to be approximately twenty 10 yd truck loads. The material will most likely be off-hauled to Kernen's construction yard on Glendale Drive, 5.6 miles from the project area.

To reduce the level of noise the subcontractor will be directed to use a pneumatic hammer or another suitable option that provides the least impact in terms of noise. Should the subcontractor determine to use a hydraulic hoe ram, they will be required to monitor noise levels and not exceed peak levels of 187 scls daily.

C) REMOVAL OF STEEL H-BEAM PILES

All 64 piles would be removed utilizing vibratory techniques. These techniques are commonly used by bridge-type contractors and would not require substantial in-channel excavation.

D) REDISTRIBUTE AND PLACE EXISTING 2-4 TON RIPRAP

Once the weir has been removed, the existing 2-4 ton boulders will be placed along the left bank as rock groins or clusters to create habitat diversity or transported and stockpiled at the hatchery yard for future use.

2. Time frame:

Assuming an executed contract with DFG by June of 2012, implementation on the proposed project would follow the timeline below:

June 2012	Finalize FRGP contract, submit subcontract to DFG for review, execute subcontract.
July 2012	Coordinate with Green Diamond and Contractor to develop access location and mobilize equipment.
August 1-September 15 (or as determined by DFG)	Instream work window: Coordinate with DFG and Grant Manager on expected timeframe for water diversion and dewatering; implement water quality BMPs; construct coffer dam; divert channel; screen and relocate fish; dewater; remove weir and off-haul materials; place boulders and displaced gravel/ rocks; remove coffer dam; recondition access point.
September-December	Final field inspection, prepare Final Report

3. Deliverables:

Monthly invoices and reports will be prepared and submitted. Upon completion of the project a final written report will be submitted. The report will contain: 1) general grant information, 2) location of work, 3) project start and end dates, 4) an accounting of fund sources, 5) expected benefits to anadromous salmonids, 6) pre and post photos, 7) access information, 8) as built information, and 9) measurable metrics which include a post-project longitudinal profile.

4. **DFG protocols to be used in project development and implementation (check applicable box):**

☒ DFG California Salmonid Stream Habitat Restoration Manual

Manual part number: Part VI – 51 Human Induced Obstructions

☐ DFG monitoring protocols for restoration project effectiveness and validation monitoring

List part number:

5. **Other protocols:**

In developing this proposal, HCRCD has consulted with engineers, fisheries biologists, and hydrologists from Department of Fish and Game, NOAA, and Caltrans.

6. **Expected quantitative results (project summary):**

Instream Barrier Modification for Fish Passage (HB)

a. Miles of stream treated (include only the actual length of stream <i>treated</i> by the project, not the length of stream <i>affected</i> by the project)	<u>0.25</u> miles
b. Number of barriers other than culverts improved for fish passage	<u>1</u> #
c. Type(s) of barriers treated	<input type="checkbox"/> diversion dam <input type="checkbox"/> push-up dam <input type="checkbox"/> wood or concrete dam <input checked="" type="checkbox"/> weir <input type="checkbox"/> logs <input type="checkbox"/> debris
d. Miles of stream made more accessible by removing barriers other than culverts (accessible to next barrier or to upstream end of anadromy)	<u>87.7</u> miles
e. Number of fishway chutes/pools installed	<u>N/A</u> #
f. Number of fish ladders installed/improved	<u>N/A</u> #

7. Other products and results:

This proposal takes advantage of a unique opportunity to leverage funding available through a Cooperative Agreement between HCRCD and Caltrans for an enhancement project on the Mad River.

Section 6: Qualifications and experience of applicant and professionals:

1. Applicant's qualifications and experience:

The expertise of HCRCD core personnel is augmented by working in collaborative agency partnerships and retaining professional consultants and contractors for specific tasks as needed. To develop this project HCRCD has partnered with representatives of Caltrans, Department of Fish and Game and NOAA fisheries. HCRCD also has a strong working relationship with USDA/Natural Resources Conservation Service, through which technical and professional assistance is provided to landowners for developing and implementing resource conservation and habitat improvement practices. HCRCD also retains and collaborates with professional engineers, geologists, foresters, biologists and botanists as needed.

Over the past 24 years, HCRCD has worked with individuals, groups and in partnerships such as this to complete over 50 federal and state contracts. The RCD has a history of positive audits; testimony to the RCD's ability to effectively manage public funds. The RCD currently holds 17 project contracts with a total funding value of \$8,719,789 and is administering 17 subcontracts valued at \$3,154,275.

Throughout its history HCRCD has collaborated with landowners, agency partners, consultants and contractors to implement a range of water quality improvement projects, from sediment reduction to dairy nutrient management. HCRCD has extensive experience in completing cooperative upslope sediment reduction projects and in-stream improvement projects on private lands. HCRCD completed three phases of the Eel River Cooperative Sediment Reduction and Water Quality Improvement Program funded through State Water Resources Control Board. Through this program, HCRCD worked with private landowners to complete 35 projects for sediment reduction and stream bank stabilization in the Van Duzen River Watershed and 31 such projects in the South Fork Eel River Watershed. Activities included such tasks such as installing culverts, armoring and storm-proofing stream crossings, stabilizing streambanks and streamside landslides, installing cattle exclusion fencing, and riparian revegetation. HCRCD has also implemented a number of projects for sediment control and riparian corridor improvement practices in the Lower Eel Delta region. Over the past several years, HCRCD has also worked collaboratively to implement road decommissioning work on private lands.

HCRCD is currently the lead project proponent for the Salt River Ecosystem Restoration Project, a multi-agency, multi-disciplinary, multi-million dollar watershed scale restoration project. With its many partners, HCRCD has completed the project Environmental Impact Report, coordinated regular meetings of involved partners, provided outreach and education about the project and its benefits, assured compliance with state contracts, administered an array of subcontracts to achieve multiple objectives, accomplished regular invoicing and reporting to the state, and worked collaboratively with Department of Fish and Game, Western Rivers Conservancy, Natural Resources Conservation Service, State Coastal Conservancy, Ducks Unlimited, NOAA and others to leverage additional project funding.

2. Previous projects funded by FRGP:

P0410509: Lower Eel River Basin Watershed Organizational Support Phase IV: Completed
P0310520: Salt River Restoration Feasibility Phase- Completed
P0710527: Freshwater Creek Road Decommissioning – On-going
P0710528: Elk River Road Decommissioning – Completed
P0710543: Iaqua Ranch Roads Sediment Reduction – Completed
P0810513: South Fork Elk Road Decommissioning – On-going
P0810308: Freshwater Creek – Cloney Gulch Road Decommissioning – Not started
P0910509: Refuge Creek – Ongoing

3. Professionals qualifications and experience:

Glenn Hurlburt has a BS degree in Fisheries from Humboldt State University. He is a Registered Professional Engineer in Civil Engineering with 30 years experience working at Caltrans in different functional units including Surveying, Design, Seismic, Construction and Hydraulics. He designed and administered two fish passage projects completed in 2007 and 2010. Mr. Hurlburt is currently working as fish passage designer for mitigation projects associated with the Mad River Bridges project. Those mitigation projects are separate and distinct from this enhancement project. Mr. Hurlburt is working with project partners and providing his expertise in project budgeting and engineering to this collaborative fish passage enhancement project.

Margaret Tauzer of NOAA Fisheries and Mark Smelser, Engineering Geologist with DFG have also been consulted in the development of this project.

These partners have been involved with the planning of the project and will work with HCRCD to identify an experienced contractor and develop the contract to complete the work.

4. Examples of similar work:

HCRCD is partnering on this project with Caltrans engineers who have experience in working in this type of environment and with the demolition of similar structures.

Section 7: Landowners Access, Permits

1. Landowners Granting Access for Project: (Attach provisional access agreement[s] and indicate here if applicant is the landowner).

Please see attached Provisional Landowner Access Agreement on pages 25-26 executed by representatives of Green Diamond, the landowner adjacent to project area.

2. Permits:

1600

3. Lead CEQA agency:

Department of Fish and Game

4. Required mitigation:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
5. Listed species:	Individual consultation or surveys will not be required for this project. All mitigation measures described in the Regional General Permit will be followed.

Section 8: Project Budget
1. Detailed Project Budget

DETAILED PROJECT BUDGET

PROJECT NAME: Mad River Weir Removal

	Hours or Units of Amount Requested	Hours or Units of Applicant Cost Share	Hours or Units of Partner Cost Share	Hourly Rate or Unit Price	Amount Requested	Applicant Amt. of Cost Share	Partner Amt. of Cost Share	Total Project Cost
A. PERSONNEL SERVICES								
Level of Staff								
Executive Director	20			\$ 31.18	\$ 623.60			\$ 623.60
Project Manager	100			\$ 27.73	\$ 2,773.00			\$ 2,773.00
Project Coordinator	10			\$ 16.83	\$ 168.30			\$ 168.30
Office Manager	10			\$ 15.73	\$ 157.30			\$ 157.30
Subtotal	140				\$ 3,722.20			\$ 3,722.20
Benefits @ 30%					\$ 1,116.66			\$ 1,116.66
TOTAL PERSONNEL SERVICES					\$ 4,838.86			\$ 4,838.86

B. OPERATING EXPENSES								
Description	# Of Units Amount Requested	# Of Units Applicant Cost Share	# Of Units of Partner Cost Share	Unit Price	Amount Requested	Applicant Amt. of Cost Share	Partner Amt. of Cost Share	Total Project Cost
<i>Subcontractors/Materials/Supplies:</i>								
Access Rd (400 ft on gravel bar)	100 cy			\$ 50.00	\$ 5,000.00			\$ 5,000.00
Water Diversion								\$ -
Place Gravel Berm	500 cy			\$ 100.00	\$ 16,000.00		\$ 34,000.00	\$ 50,000.00
Pumps	3 ea			\$ 3,000.00	\$ 9,000.00			\$ 9,000.00
Water Pollution Control (BMP.s)	1 ea			\$ 7,000.00	\$ 7,000.00			\$ 7,000.00
Fish Exclusion/Removal								
Fish Screen	60 ft			\$ 2.00	\$ 120.00			\$ 120.00
"T" Posts	60 ea			\$ 10.00	\$ 600.00			\$ 600.00
Sand Bags	80 ea			\$ 5.00	\$ 400.00			\$ 400.00
Electrofishing	4 passes			\$ 1,500.00	\$ 6,000.00			\$ 6,000.00
Fish Screen Maintenance	40 hrs			\$ 30.00	\$ 1,200.00			\$ 1,200.00
Right of Way Access (Road Improvements)	1 mi			\$ 5,000.00	\$ 5,000.00			\$ 5,000.00
Concrete Weir Removal	3330 sf			\$ 25.00	\$ 33,250.00		\$ 50,000.00	\$ 83,250.00
Relocate Rip Rap	30 T			\$ 500.00	\$ 7,000.00		\$ 8,000.00	\$ 15,000.00
Remove Piles	64 ea			\$ 1,000.00	\$ 14,000.00		\$ 50,000.00	\$ 64,000.00
Erosion Control	.5 ac			\$ 3,000.00	\$ 3,000.00			\$ 3,000.00
Permits	1 ea			\$ 5,000.00	\$ 5,000.00			\$ 5,000.00
Disposal	170 cy			\$ 100.00	\$ 9,000.00		\$ 8,000.00	\$ 17,000.00
Miscellaneous Items	1 ls			\$ 3,000.00	\$ 3,000.00			\$ 3,000.00
Labor Compliance	1			\$ 2,000.00	\$ 2,000.00			\$ 2,000.00
TOTAL OPERATING COST					\$ 126,570.00	\$ -	\$ 150,000.00	\$ 276,570.00

[illegible]

2. Budget justification:

The budget reflects prevailing wage rates for the subcontractor and a labor compliance plan. Project proponents have been advised that the Caltrans funds typically require paying prevailing wage and documentation of compliance with certain labor regulations, so that has been factored into the budget.

3. Administrative overhead:

An administrative rate of 10% is being applied to the project. HCRCD administrative overhead costs include accounting, audit, insurance, postage, utilities, and audit file storage fees.

4. Summary project costs

Sources of Funds	Cash	In-kind (if applicable)	Status S,P,U (secured, pending, unknown)	Anticipated award date	Total
Fisheries Restoration Grant Program	\$144,549.75				\$144,549.75
Other State Agencies <u>Name(s) and amount(s) of each:</u>	Caltrans \$150,000.00		P		\$150,000.00
Federal <u>Name(s) and amount(s) of each:</u>	N/A				
Applicant (indicate if Federal):	N/A				
Other Sources <u>Name(s) and amount(s) of each:</u>	N/A				
Total	\$294,549.75				\$294,549.75

5. Is any of the cost share being used as match for other (non-FRGP) funding for the project?

NO

6. In-kind Detail:

<i>In-kind Detail: Labor</i>				
Type of In-kind Contribution	Source of In-kind Contribution	Total Hours	Value of Labor (\$)	Describe how the labor value was determined
Volunteer labor	N/A			
Non-volunteer labor (employees whose labor is not paid for by FRGP funding)	N/A			

<i>In-kind Detail: Materials and Equipment</i>		
Description of In-kind Contribution (materials, equipment, etc.) <i>[Add rows as needed]</i>	Source of In-kind Contribution	Value of contribution (\$)
N/A		

7. Estimated Project Cost by Task

<i>Estimated Project Cost by Task - Project Name</i>			
<i>MAD RIVER WEIR REMOVAL</i>			
Type of Work	Amount Requested	Cost Share	Total
Fish Screens			
Fish Passage	\$144,549.00	\$150,000.00	\$294,549.00
Instream Flow			

Instream Habitat			
Riparian Habitat			
Upland Habitat			
Wetland Habitat			
Estuarine Habitat			
Total	\$144,549.75	\$150,000.00	\$294,549.00

Section 9: Supplemental or Specialized Information

In the order listed below, please attach the following required items to the application, as appropriate to the proposal project type:

- ☐ 1. Intermediate Plans.

(Project Types: FP, SC)

- ☐ 2. Conceptual Plans.

(Project Types: HS, HU, WC)

- ☒ 3. Intermediate or Conceptual Plans.

(Project Types: HB, HI, WD)

- ☒ 4. Project Location Topographic Map.

(Project Types: FP, HA, HB, HI, HR, HS, HU, MD, MO, PD, PL, RE, SC, TE, WC, WD, WP)

- ☐ 5. Watershed (or County) Map.

(Project Types: AC, HA, HU, MD, MO, OR, PD, PI, PL, RE, TE, WD, WP)

- ☒ 6. Provisional Landowner Access Agreement/Provisional Resolution.

(Project Types: FP, HA, HB, HI, HR, HS, HU, MD, MO, PD, PL, RE, SC, TE, WC, WD, WP)

- ☒ 7. Water Right Verification

(Project Types: FP, HB, SC, WC, WD, WP)

- ☒ 8. Photographs

(Project Types: FP, HA, HB, HI, HR, HS, PD, RE)

- ☐ 9. Status Report (Existing projects only).

(Project Types: OR, PI)

- ☐ 10. Fence Maintenance Plan.

(Project Type: HR)

- ☐ 11. Riparian Restoration Plan.

(Project Type: HR)

- ☐ 12. Quality Assurance and Quality Control (QA/QC) Plan

(Project Type: MD, MO)

- ☐ 13. Existing Condition Sketch.

(Project Type: PD)

- ☐ 14. Narrative appraisal.

(Project Type: WP)

☐ 15. Five year Management Plan
(Project Type: RE)

☐ 16. Ownership Deed
(Project Type: HA)

☐ 17. Regional Assessor Site Specific Map
(Project Type: HA)

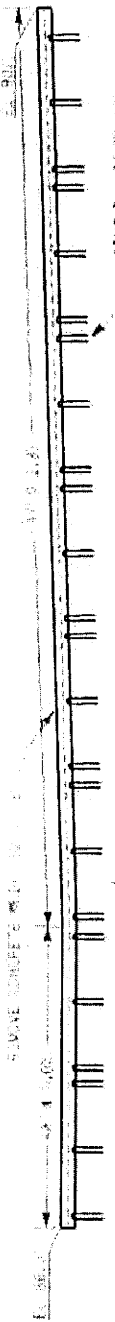
☐ 18. Evaluation Plan
(Project Type: TE)

SECTION 9
SUPPLEMENTAL INFORMATION

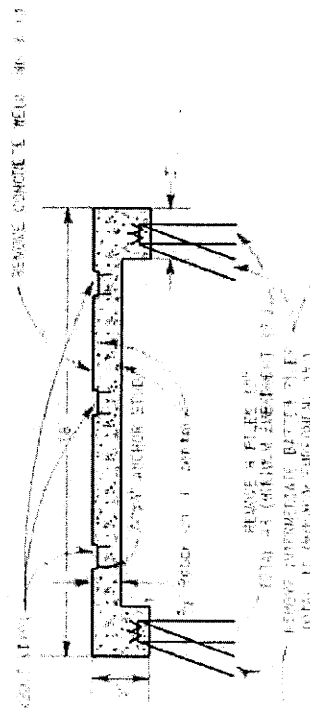
- ✓ PLANS
- ✓ PRE-PROJECT LONGITUDINAL PROFILE
- ✓ VICINITY MAP
- ✓ ACCESS AGREEMENT
- ✓ WATER RIGHTS VERIFICATION
- ✓ PHOTOS

Sheet	County	Route	Project	Scale	DATE PLOTTED 02/11/2020
1	San Diego	52	San Diego	1" = 10'	02/11/2020

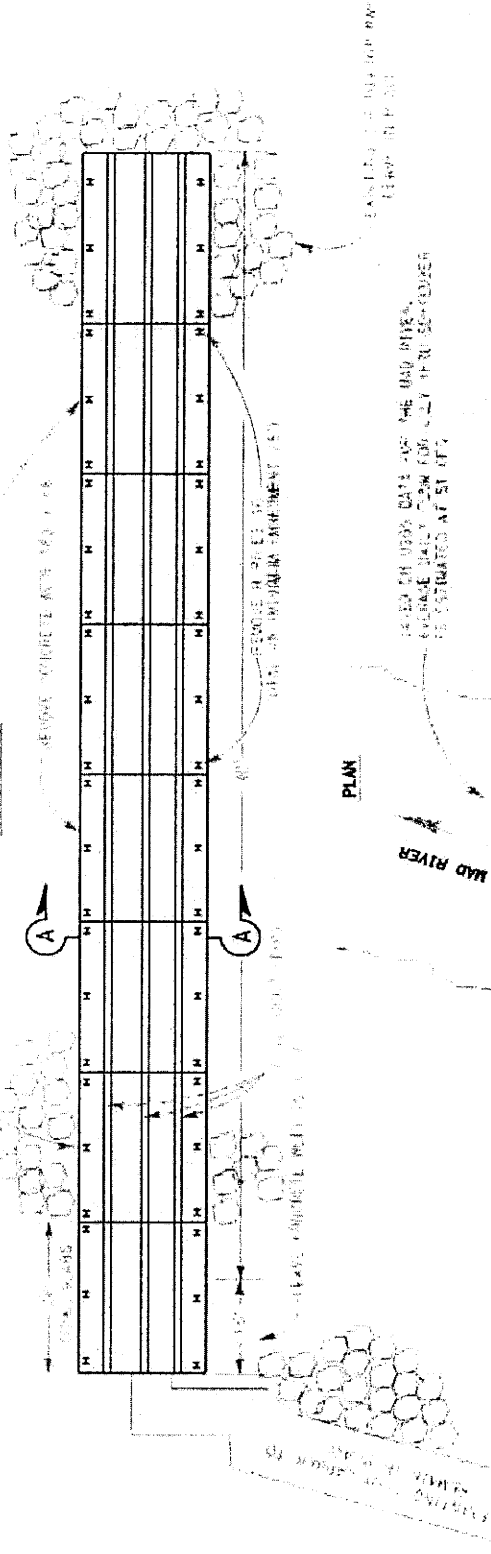
REGISTERED CIVIL ENGINEER	DATE
PLUM APPROVAL DATE	



PROFILE



SECTION A-A

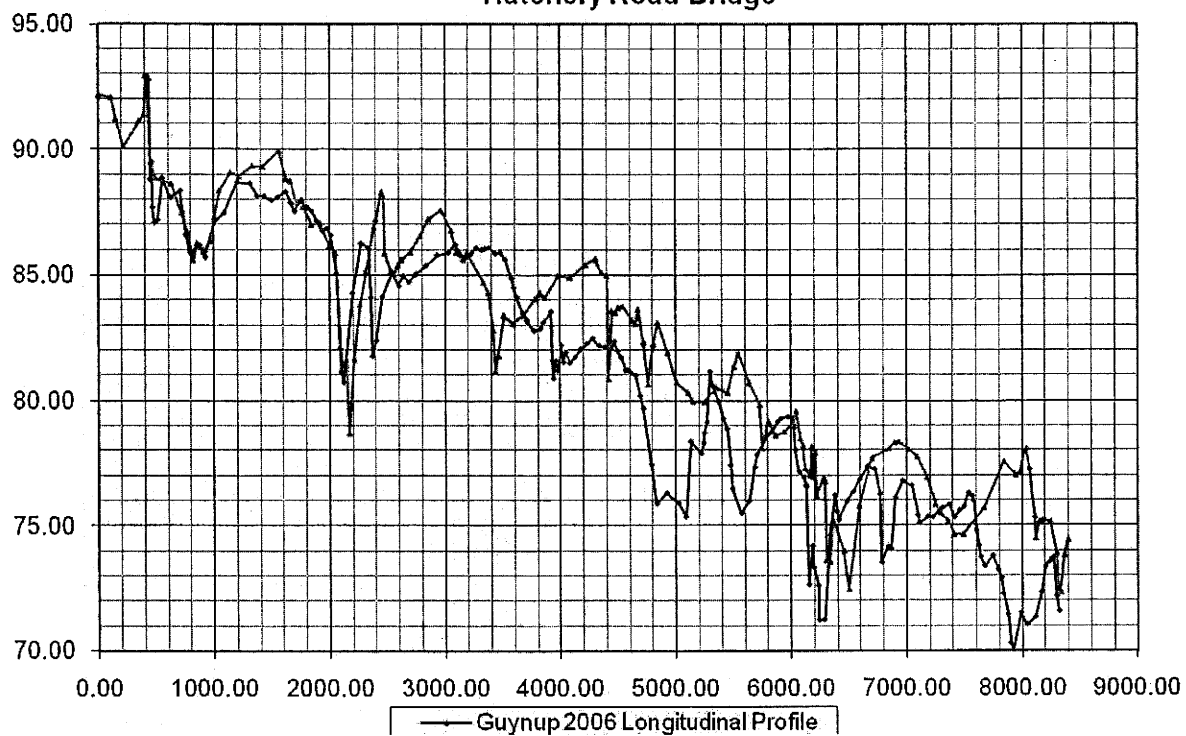


PLAN

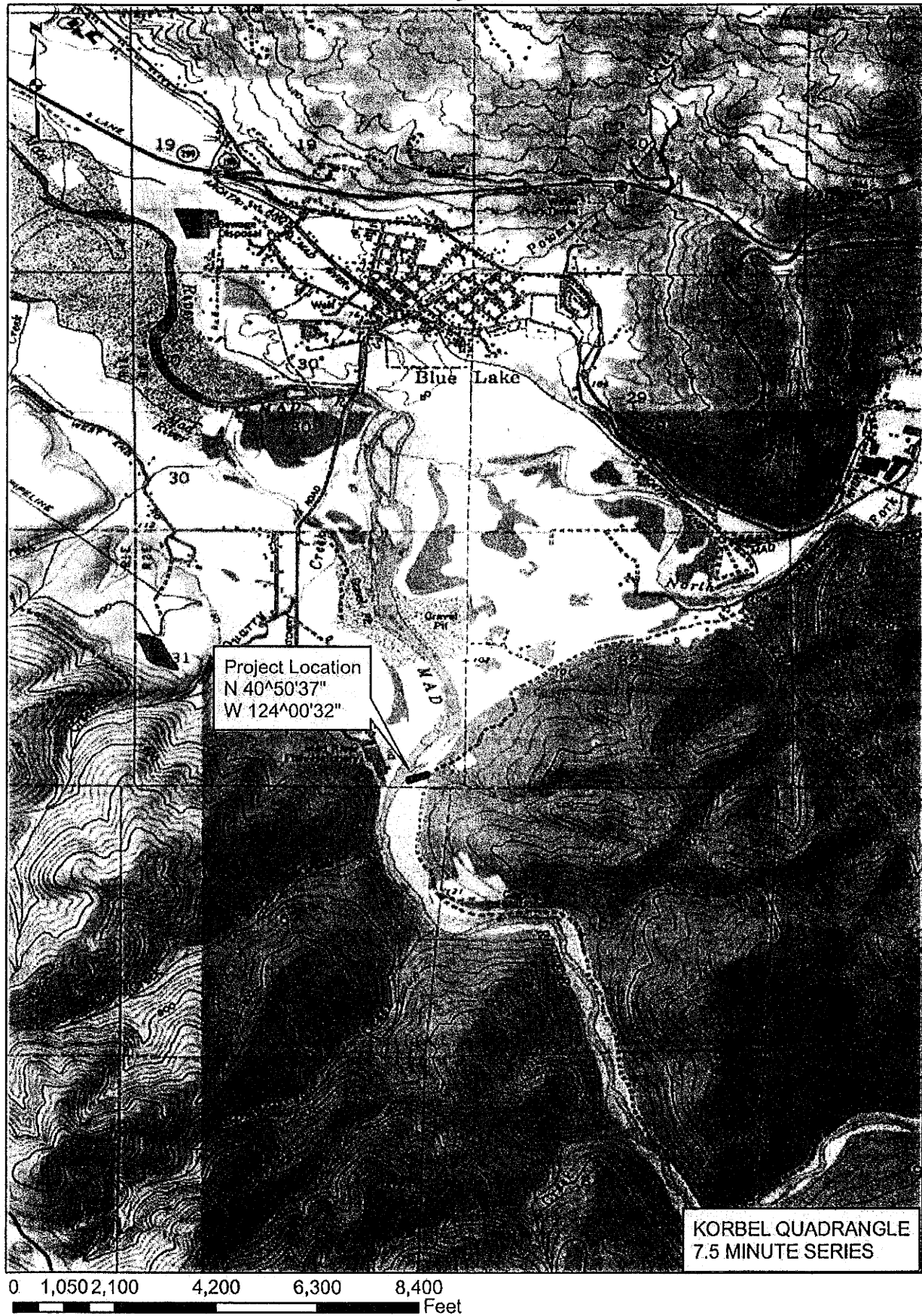
EXISTING CONCRETE FISH WEIR

DATE PLOTTED 02/11/2020
 SHEET 01 OF 01
 PROJECT 01
 SCALE 1" = 10'

Thalweg Profile of Mad River from 400 feet above the hatchery to the Hatchery Road Bridge



Mad River Weir Removal
Humboldt County RCD
Vicinity Map





Humboldt County Resource Conservation District

5630 South Broadway, Eureka, CA 95503-6905

Phone: (707) 444-9708 Ext 115 FAX: (707) 442-7514

www.humboldtccd.org

Provisional Landowner Access Agreement Access/Entry Agreement

MAD RIVER WEIR REMOVAL PROJECT

I. PURPOSE

The following agreement details requirements of both the landowner and the Humboldt County Resource Conservation District regarding the proposed Mad River Fish Hatchery Weir Removal Project. Green Diamond property on the east side of Mad River will be traversed to allow ingress and egress to the project site which is located in the Mad River adjacent to the California Department of Fish and Game (DFG) Fish Hatchery near Blue Lake, California.

Green Diamond, hereinafter called "Landowner", is aware that a habitat restoration project grant application has been submitted to the California Department of Fish and Game (DFG) for funding. The project has been explained to Green Diamond representatives by the Humboldt County Resource Conservation District and/or their representatives. Green Diamond supports the goals of the project and is willing to provide access to the project site as needed for pre and post-project reviews and for construction. If the project is selected for funding, the Landowner will enter into an access agreement that will be project specific.

II. ACCESS PERMISSION

Landowner hereby grants representatives of Humboldt County Resource Conservation District, DFG, and NOAA Fisheries permission to enter onto real property owned by the Landowner to perform pre-project evaluation. Access shall be limited to those portions of Landowner's real property that must be traversed to gain access to the work site. The applicant will contact the Landowner at least 72 hours prior to any visit. At no time will DFG or NOAA Fisheries representatives access the property without the applicant unless expressly given permission by the Landowner.

III. DURATION OF NOTICE

The term of this agreement shall commence upon signing of this Agreement and terminate on March 31, 2012.

IV. LIABILITIES

Reasonable precautions will be exercised by Humboldt County Resource Conservation District to avoid damage to persons and property. Humboldt County Resource Conservation District agrees to indemnify and hold harmless the Landowner and agrees to pay for reasonable damages proximately caused by reason of the uses authorized by this agreement, except those caused by the gross negligence or intentional conduct of the Landowner.

Working in Cooperation with NOAA National Wetlands Conservation Service

MAD RIVER WEIR REMOVAL PROJECT – ACCESS AGREEMENT

Signature on File

Landowner Signature

NEAL EWALD VPCM

Box 68 KOROHA CA 95556

Landowner Address

MARCH 7, 2011

Date

707 668 4400

Landowner Phone Number

Signature on File

Executive Director

Humboldt County Resource Conservation District

707-444-9708 ext 117

donnahercd@yahoo.com

3-7-2011

Date

Working in Cooperation with U.S.D.A. Natural Resources Conservation Services

MAD RIVER WEIR REMOVAL PROJECT

SUPPLEMENTAL INFORMATION

WATER RIGHTS VERIFICATION

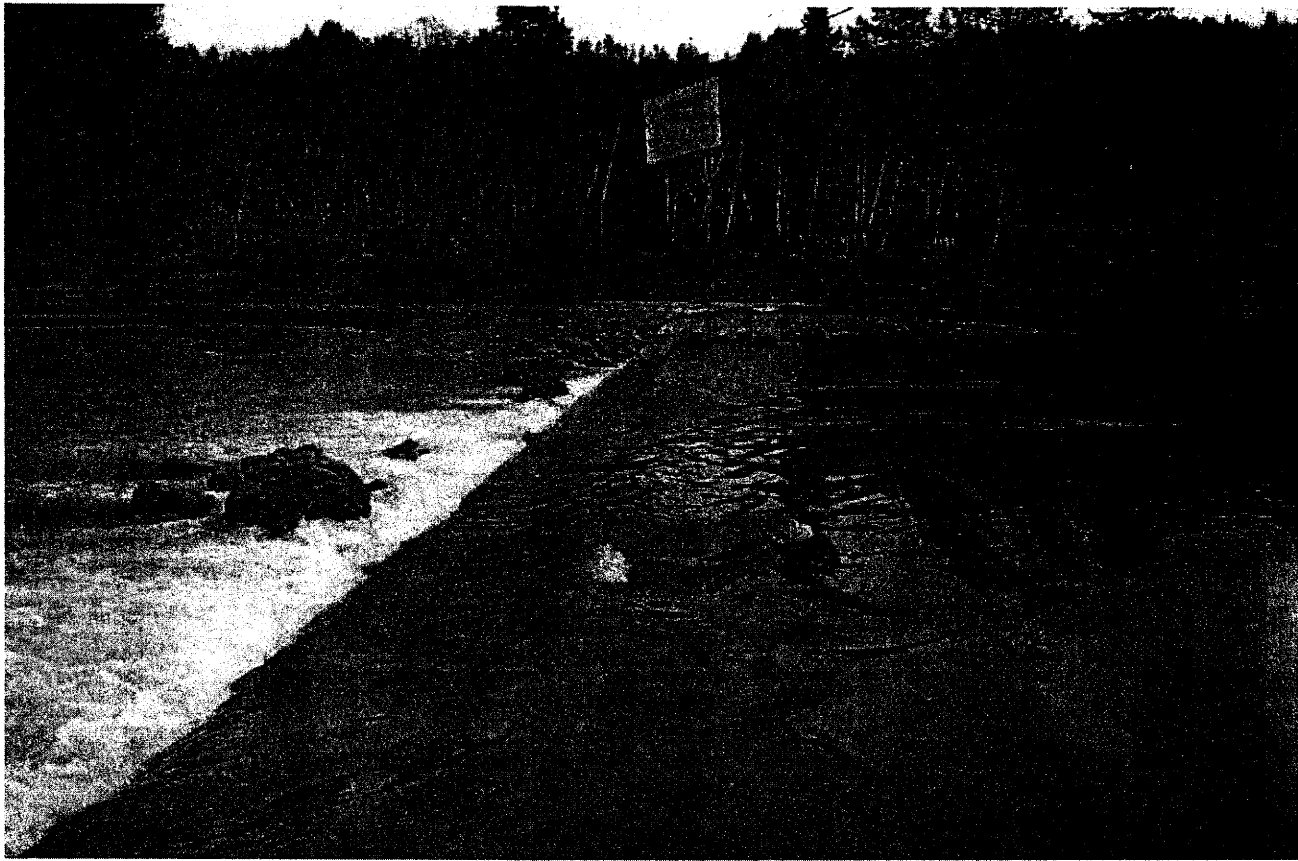
This project will have no impact on water rights.



Photo 1. Aerial photograph of the Mad River fish hatchery and weir (Google, 2010)



Photo 2. Warning sign at the weir (January 10, 2011).



Photo

Photo 3. Mad River weir (January 10, 2011).

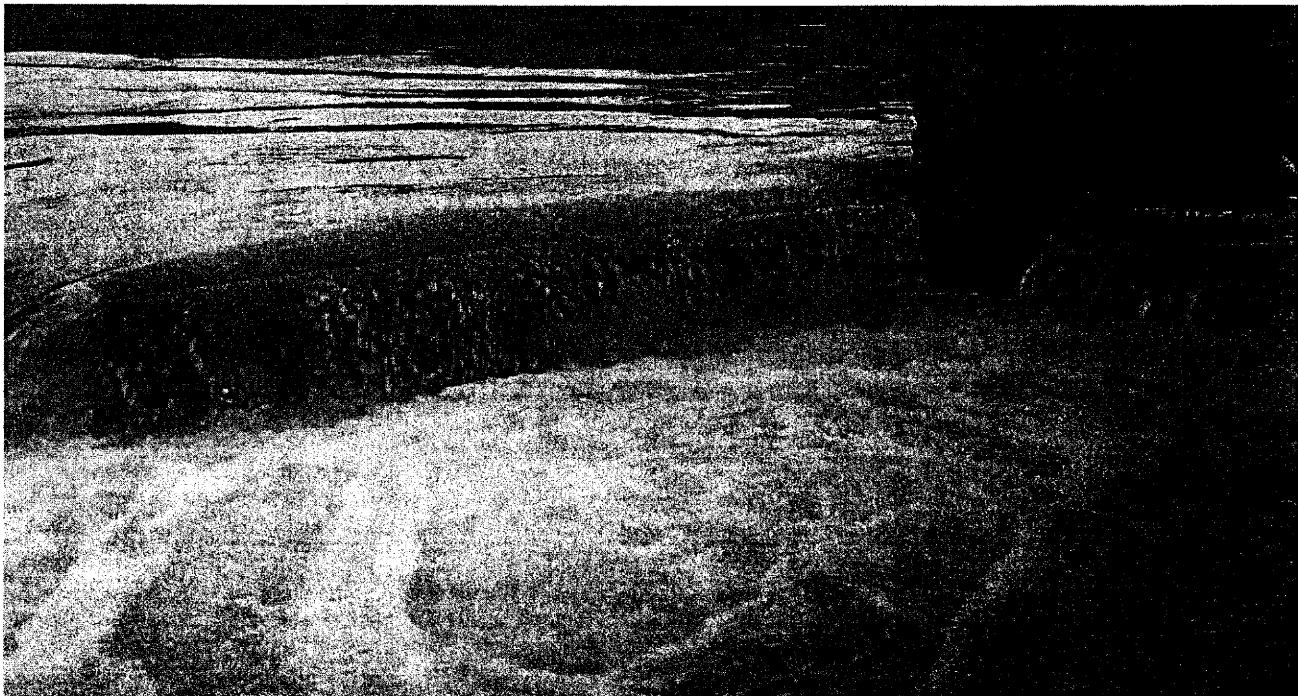


Photo 4. Weir and ladder connection (January 10, 2011).

CALIFORNIA COASTAL COMMISSION

NORTH COAST DISTRICT OFFICE MAILING ADDRESS:
710 E STREET • SUITE 200 P. O. BOX 4908
EUREKA, CA 95501-6813 EUREKA, CA 95502-4908
VOICE (707) 445-7833
FACSIMILE (707) 445-7877



Hearing Date: 1/11/08
Approved w/Conditions
Vote: 10-0 (unanimous)

Adopted Findings: Revised Staff Report**EXHIBIT NO. 10****APPLICATION NO.**

1-07-013-A3 - CALTRANS
ADOPTED FINDINGS CDP
1-07-013 (1 of 133)

APPLICATION:**1-07-013****APPLICANT:****Caltrans, District 1 (Eureka)****PROJECT LOCATION:**

U.S. Route 101, Mad River Bridges,
Between Arcata and McKinleyville,
unincorporated area of Humboldt County.

PROJECT DESCRIPTION:

Construct two new cast-in-place (CIP) concrete box girder bridges, reconfigure new on and off ramps and Central/Route 200 intersection, and demolish the existing bridges. The new bridges would be about 750 feet long, and each bridge would have two 12-foot-wide traffic lanes, a 5-foot-wide inner shoulder and a 10-foot-wide outside shoulder. The new northbound structure would also include an additional 8-foot-wide "multi-modal" (bicycle/pedestrian) corridor on the eastward side and landings at each end of the bridge. Demolish existing residence & outbuildings, relocate utilities, upgrade/install up to 10 culverts. Total grading of approximately 110,000 cubic yards (19,638 cu. yds. cut, 89,995 cu. yds. fill, 14,786 cu. yds. export – including demolition debris). Excavate lead contaminated soils east of existing bridges & dispose as hazardous wastes.

RECOMMENDATION:**Approval with Conditions****MOTION & RESOLUTION:**

Page 5

TIMING of COMMISSION ACTION:

Commission action is required during the
January 2008 meeting due to Permit
Streamlining Act requirements.

LOCAL APPROVALS REQUIRED:

None (see procedural notes on page 3),

OTHER APPROVALS RECEIVED:

State Lands Commission lease; Biological
Opinion, dated 2005, National Marine Fisheries Service (NOAA Fisheries) (new
determination is pending review in 2008); California Endangered Species Act
Consistency Determination, dated 2005 (new determination is pending review in 2008).

OTHER APPROVALS REQUIRED: NOAA Fisheries Amended Biological Opinion (Federal Endangered Species Act) and to California Department of Fish and Game Amended Consistency Determination (Section 2080.1 of the or, alternatively, an Incidental Take Permit (Section 2081 of the California Endangered Species Act), for review of newly identified significant adverse effects that pile-driving may have on endangered salmonids; CDFG 1602 Streambed Alteration Agreement; Regional Water Quality Control Board: Section 401 Certification, National Pollutant Discharge Elimination System (NPDES) permit; Amended Section 404 Permit, Army Corps of Engineers (to address changes in access, new fisheries consultations, new scour pool implementation schedule, greater in-channel impacts); amended State Lands Commission lease (to address greater activity in the river channel that Caltrans now proposes, including construction of scour pool, fish exclusion structures and exclusion of fishing & boating, construction of potential sediment basin in river channel).

1. Commission Action at January 11, 2008 Hearing: Adopted Findings

The Commission held a public hearing and approved the permittee's application for Coastal Development Permit 1-07-013, with conditions, at the meeting of January 11, 2008. The adopted conditions and findings for approval differ slightly from those contained in the written staff recommendation dated December 21, 2007 (Attachment A). Prior to the hearing, staff prepared two addenda (Attachments B and C) dated January 10, 2008 and January 11, 2008, to the staff recommendation. The Commission adopted the staff recommendation as modified. The resolutions, conditions, and findings commencing on page 4 were adopted by the Commission on January 11, 2008 upon conclusion of the public hearing.

2. Jurisdiction and Standard of Review

The proposed project area is bisected by the boundary between the retained coastal development permit jurisdiction of the Commission and the coastal development permit jurisdiction delegated to Humboldt County by the Commission through the County's certified Local Coastal Program.

The Coastal Act was amended by Senate Bill 1843 in 2006, effective January 1, 2007. The amendment added Section 30601.3 to the Coastal Act. Section 30601.3 authorizes the Commission to process a consolidated coastal development permit application when requested by the local government and the applicant and approved by the Executive Director, for projects that would otherwise require coastal development permits from both the Commission and from a local government with a certified LCP.

In this case, the Humboldt County Board of Supervisors adopted a resolution and Caltrans submitted a letter requesting consolidated processing of the coastal

development permit application by the Commission for the subject project, which was approved by the Executive Director.

The policies of Chapter 3 of the Coastal Act provide the legal standard of review for a consolidated coastal development permit application submitted pursuant to Section 30601.3. The local government's certified LCP may be used as guidance.

The application fee for a consolidated coastal development permit is ordinarily determined by the Commission's permit fee schedule. However, the Commission does not require state or local governments or agencies to pay application fees.

3. Exhibits

Caltrans provided the exhibit packages attached to the staff report dated December 21, 2007 (Attachment A) for all Exhibits labeled in alphabetical series (Exhibits AA-EE and Exhibits A-Y). Additional exhibits are listed in the usual series (Exhibit 1, etc.) In some cases, to save costs and materials, exhibits with colored features are only reproduced in black-and-white, but are provided in color on the Commission's website.

4. Staff Contact

Please contact Melanie Faust, Senior Coastal Planner, Robert Merrill, North Coast District Director, or Peter Douglas, Executive Director, at 707-445-7833 (or the letterhead address) for additional information.

SUMMARY

California Department of Transportation (hereinafter "Caltrans" or "applicant") proposes to replace a pair of aging highway bridges on Highway 101, north of Arcata, at the Mad River. The bridges are structurally and seismically deficient. The Mad River crossing is essential to continued public access to the world class coastal recreation amenities of the north coast. The project is located within the Mad River corridor of rural Humboldt County, in the midst of prime agricultural lands. State and federally listed salmonids inhabit the river in the project vicinity, and mature riparian canopy covers most of the nearby river banks. The proposed project would permanently impact almost two acres of wetlands/riparian habitat, permanently convert almost 4 acres of prime agricultural lands to highway use, affect approximately 8 acres of stream channel habitat over the course of the 4 or 5-year project, and – if constructed as initially proposed—potentially take as many as 50,000 listed salmonids, as the result of driving the 7-foot-diameter steel shell piles Caltrans proposes to use for bridge foundations.

To ensure that this vital public project is carried out in a manner that least impacts sensitive coastal resources, staff recommends **approval of the project with conditions**. The recommended 20 Special Conditions attached hereto, fully implemented, would ensure adequate collection and assessment of baseline data necessary to accurately gauge important project impacts and to ultimately secure adequate, proportional mitigation of these impacts, including the protection of water quality, stream habitat, wetlands, and sensitive species, to the maximum extent feasible.

Of particular note, the attached special conditions provide for partial mitigation of the permanent conversion of prime agricultural lands associated with Caltrans projects on the north coast through the endowment of a \$2 million fund for the agricultural education program of the College of the Redwoods, and the program's sustainable agricultural teaching farm.

1.0 RESOLUTION ADOPTED BY THE COMMISSION

Resolution to Approve Permit:

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

2.0 STANDARD CONDITIONS

- 1. Notice of Receipt and Acknowledgement:** This permit is not valid until a copy of the permit is signed by the Permittee or authorized agent, acknowledging receipt of the permit and the acceptance of the terms and conditions, is returned to the Commission office.
- 2. Expiration:** Construction activities for the proposed project must be initiated within two years of issuance of this permit. This permit will expire two years from the date on which the Commission approved the proposed project if development has not begun.
- 3. Interpretation:** Any questions of intent or interpretation of any condition will be resolved by the Executive Director of the Commission (hereinafter, "Executive Director") or the Commission.

4. **Assignment:** The permit may be assigned to any qualified person, provided the assignee files with the Commission the 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.

3.0 SPECIAL CONDITIONS

For purposes of implementing the activities authorized by Coastal Development Permit 1-07-13, the following definitions shall apply:

Ordinary High Water Mark shall be defined as: that line on the riverbank established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas; and the

Wetted Channel shall be defined as that fluctuating area of the river channel that has been saturated within the previous twenty-four hours. This means that the "wetted channel" is ambulatory and may exceed the bounds of the flowing water at any particular moment.

River Corridor shall be defined as the area from top-of-bank to top-of-bank. If such reference is to the ecological context of the river corridor (for example when referring to the river corridor as a wildlife corridor or habitat), the riparian canopy will also be included and the canopy will extend further landward than the physical top-of-bank.

Water Quality Standards. References to "water quality standards" or the equivalent where used herein: shall be defined to encompass broader water quality standards such as turbidity and pH but shall also include other water quality parameters such as, but not limited to, sheens, sediment deposits resulting from turbidity plumes, temperature, and visible and non-visible pollutants. These water quality standards shall also include by reference the water quality standards and site-specific water quality objectives for the Mad River as defined in the Water Quality Control Plan for the North Coast Region (Basin Plan).

In addition, the following global change applies throughout the recommended special conditions: Wherever there is **reference to turbidity and pH standards** for de-watered effluent, or for the waters of the Mad River, or similar references, **the text is hereby changed to "water quality standards" or the equivalent in the context of the reference,** which shall incorporate the definition of "water quality standards" set forth above.

CONDITION 1. TIMING of CONSTRUCTION OTHER THAN PILE-DRIVING.

All project activities shall at all times be undertaken in full accordance with the following requirements. The timing and other restrictions on pile-driving activities that may affect the aquatic environment of the Mad River are addressed separately in Special Condition 2, and are not authorized pursuant to Special Condition 1. Any changes to these requirements proposed subsequent to Commission approval of CDP 1-07-013 shall require an amendment of Coastal Development Permit 1-07-013 unless the Executive Director determines that no amendment is legally required.

A. May 1 – June 15 annually: Project activities may be undertaken no closer to the waters of the Mad River than 25 feet landward of the Wetted Channel, and shall additionally be setback to an area that is at least two (2) feet in elevation above the wetted channel, whichever is the greater distance, provided that no discharges of sediment or other construction-related wastes enter waters of the Mad River as the result of project activities authorized by this provision. The uppermost limits of this May 1 – June 15 setback area shall be monitored in the field daily by the fisheries biological monitor and the Caltrans site supervisor.

(1) Should an unauthorized discharge of sediment or wastes into the Mad River or other water quality violations (such as a discharge that is out of compliance with water quality standards and/or site-specific water quality objectives for the Mad River defined in the Water Quality Control Plan for the North Coast Region (Basin Plan), occur during construction undertaken pursuant to Special Condition 1 (A), the Executive Director may suspend this authorization to undertake project activities during the May 1 – June 15 period within the area of the subject site described in Subparagraph A, thereafter. Under such restriction for non-compliance imposed by the Executive Director, project activities may be undertaken no closer to the waters of the Mad River than 50 feet landward from the top of bank of the Mad River, except during the June 16 – October 14 low flow construction season, unless specifically authorized by the Executive Director on a case-by-case basis. Should the Executive Director impose this limitation, it shall extend for the duration of the construction authorized by CDP 1-07-013.

(2) Project activities within the area described by Subparagraph A above shall not be undertaken unless all of the following conditions are met:

a) the three (3)-day forecast for precipitation indicates that the chance of rain is less than thirty (30) percent; and

b) soils are not saturated as indicated by standing water from previous rains anywhere within the construction site or adjacent fields; and

c) there is no precipitation at the time the proposed activities are undertaken.

(3) If rain commences while project activities are underway within the area described in Subparagraph A above, the activities shall be stopped and secured and any necessary Best Management Practices (BMPs) shall be immediately implemented to protect the water quality of the Mad River and any adjacent tributaries. Project activities within the area described in Subparagraph A shall not re-commence after precipitation commences unless all of the conditions in a), b) and c) set forth in subparagraph 2 above are met.

B. June 16 – October 14 annually: Project activities may be undertaken in any location within the areas authorized for construction pursuant to CDP 1-07-013, except for the wetted channel, unless specifically authorized by other provisions of these special conditions, if in compliance with all other applicable terms and conditions of this coastal development permit. All materials and equipment, cofferdams, temporary crossings, temporary river run fill, crane pads, etc., shall be removed from the river corridor, the disturbed banks stabilized for the rainy season, and the channel gravels re-contoured in accordance with the recommendations of the fisheries biological monitor, in consultation with the biologists of the California Department of Fish & Game and the National Marine Fisheries Service, by October 14, annually.

C. October 15 to the following April 30, annually: Project activities shall not be undertaken any closer to the waters of the Mad River than fifty (50) feet landward from the top of bank of the river. Best Management Practices shall at all times be deployed throughout the limits of project activities to ensure that no discharge occurs of any wastes, materials, contaminants, or effluent produced by de-watering that fails to meet applicable water quality standards, to the waters of the Mad River.

CONDITION 2. PILE-DRIVING.

A. Applicability. All project activities involving the installation of temporary or permanent piles at or between the location of Piers 3 and 4 shall be undertaken in accordance with the requirements set forth herein. The restrictions of this Special Condition shall apply to any pile-driving activities that have the potential to affect the aquatic environment of the Mad River, including but not limited to pile driving associated with proposed Piers 3 and 4. In addition, installation of coffer dams, testing, or other activities that may produce sound, shaking, disturbance of sediments and gravels in the riverbed, or produce other potentially disruptive effects within the aquatic environment, regardless of whether such activities are undertaken outside of the limits of the flowing waters of the river, shall additionally be subject to the requirements of the special conditions set forth herein. All project activities shall at all times be undertaken in full accordance with the following requirements.

B. Timing & Limitations

1) Pile-driving shall be limited to daylight hours (between sunrise and sunset, provided that there is sufficient visibility for the marine mammal monitor and for the

fisheries biological monitor, where applicable) and shall not be extended through the use of artificial lighting within the Mad River corridor.

2) Pile-driving of temporary or permanent piles at or between the locations of Piers 3 and 4 shall be limited annually to July 1 – September 1, including these dates, and shall only be undertaken while approved fish exclusion measures are in place. Installation of sheet piles to install coffer dams in preparation for pile-driving at Piers 3 and 4 may be undertaken without this restriction, provided that the installation of sheet piles at the Pier 3 & 4 locations shall be subject to the hydroacoustic monitoring plan required by Special Condition 4, and shall not exceed the dual metric criteria at any location within the Mad River.

3) Pile-driving at Pier 2 shall not commence prior to September 1, 2008. Pile-driving at Pier 2 is not limited to the July 1- September 1 window that applies pursuant to Subparagraph 2) above, and is not anticipated to produce effects in the waters of the Mad River that would exceed the Dual Metric Threshold; however, because the acoustical estimates contain a degree of uncertainty, and because the river's seasonal hydrology varies significantly, the hydroacoustic monitoring plan required pursuant to Special Condition 4 shall incorporate provisions to perform hydroacoustic monitoring of pile-driving at the Pier 2 location(s) to the satisfaction of the Executive Director, for the purpose of confirming that the Dual Metric Threshold is not exceeded within the waters of the Mad River during the subject pile-driving.

4) Pile-driving of steel shell piles shall be limited to a maximum of two pile sections per day.

C. Executive Director Limited Exception

Upon Caltrans' request, the Executive Director, after conferring with the fisheries biologists of the California Department of Fish & Game and the National Marine Fisheries Service, may allow a limited exception to the restrictions set forth in Subparagraph B above, provided that the Executive Director receives convincing evidence that: a) such extension would substantially prevent the need for an additional year of pile-driving disturbance that could adversely affect the aquatic environment of the Mad River, b) no alternative to meet this goal other than the requested exception exists, and c) the need for the exception was not foreseeable and the remaining time does not allow for the processing of an amendment to CDP 1-07-013. In addition, the only grounds for approval of such an exception would be clear evidence vetted by qualified biologists to the Executive Director's satisfaction that the requested exception to the requirements of Subparagraph B above would provide a significant overall reduction in potential adverse impacts on sensitive species, compared with the impacts that would occur should the exception be denied.

D. Monitoring

Pile-driving activities subject to Special Condition 2 shall only be undertaken if all of the following conditions are continuously met. If any of these conditions are not met at any time after pile-driving commences, the fisheries biological monitor shall direct that the pile-driving activities stop until such compliance is established:

- 1) at least one authorized fisheries biological monitor is present at the location of the pile-driving. It shall be Caltrans' responsibility to ensure that adequate biological monitoring personnel are available to staff this monitoring obligation and to ensure that other monitoring (for example verifying the stability of the fish exclusion structures) tasks are also completed.
- 2) the hydroacoustic monitoring personnel and equipment are in place and ready to commence monitoring.
- 3) personnel and equipment for any concurrent monitoring/studies (such as caged fish studies) that are being conducted to evaluate the effects of the pile-driving are in place and ready for pile-driving to commence.
- 4) the approved "fish exclusion zone" and other pertinent fisheries protection measures required by Special Condition 5 are fully in place and the fish exclusion zone has been de-populated of all fish species and of sensitive species of other taxa (e.g., red-legged frogs) to the maximum extent feasible, and the fisheries biological monitor has verified this status (if the netting or other structures defining the exclusion zone fail, then depopulation must be re-established and verified by the fisheries biological monitor following repair, before pile-driving resumes); and
- 5) neither criteria of the dual metric exposure criteria set forth in Special Condition 4 below is exceeded pursuant to the methods of monitoring and responsive construction site management set forth in the approved final hydroacoustic monitoring plan prepared pursuant to the requirements of Special Condition 4.

If any of the above conditions are not met at any time during pile-driving, pile-driving operations shall be stopped until compliance is restored, and pile-driving shall not recommence until full compliance with all pertinent conditions has been verified by the fisheries biological monitor and entered into the monitoring records. If pile-driving is stopped because hydroacoustic limits are exceeded, additional requirements pursuant to Special Condition 4 and other special conditions set forth herein shall apply.

E. Future Amendment. Project activities shall be conducted at all times in accordance with these provisions. Any proposed changes to these pile-driving requirements and limitations shall be reported to the Executive Director. No changes to the requirements of the special condition shall be made without a Coastal Commission approved amendment of CDP 1-07-013 unless the Executive Director determines that no amendment is legally required.

CONDITION 3. FINAL STATE & FEDERAL AUTHORIZATIONS; RESPONSIBILITY.

A. PRIOR TO ISSUANCE OF CDP 1-07-013, 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. 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 no amendment is legally required.

B. Responsibility: Caltrans, in accepting the benefits of CDP 1-07-013, agrees and accepts the following:

(1) 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 1-07-013 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 1-07-013, 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 1-07-013. A copy of the adopted findings for CDP 1-07-013 shall be provided to Caltrans subsequent to final Commission action, and a complete copy of the adopted findings and final plans approved by the Executive Director shall be attached to the bidding documents by Caltrans for reference by potential bidders; and

(2) 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. 1-07-013, are fully informed of, and continuously comply with, the obligations set forth in the adopted findings referenced in Subparagraph (C)(1) above. Caltrans shall ensure that a complete copy of the adopted findings is maintained on the job site at all times and that each contractor undertaking any portion of the development authorized herein has a

copy of the adopted findings upon execution of the contract for the subject project. 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 1-07-013, either individually or in addition to enforcement action against Caltrans for such non-compliance; and

(3) All activities associated with performing the development authorized pursuant to CDP 1-07-013 shall at all times be undertaken in full accordance with the terms and conditions imposed by the Commission in conditionally approving CDP 1-07-013. 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.

(4) Caltrans shall ensure that any contractor, subcontractor, or other representative of Caltrans, and Caltrans employees, understand and accept the terms and conditions of CDP 1-07-013 and all other applicable permits and authorizations imposed or granted by other state and federal agencies, and shall submit evidence to the satisfaction of the Executive Director, prior to commencement of construction by any selected contractor, that all pertinent parties have received and reviewed the applicable permits, agreements, and authorizations and understand and agree to comply with the requirements set forth therein.

CONDITION 4. HYDROACOUSTIC MONITORING PLAN; DUAL METRIC EXPOSURE CRITERIA

A. PRIOR TO ISSUANCE OF CDP 1-07-013, Caltrans shall submit a Hydroacoustic Monitoring Plan, containing all supporting information and analysis deemed necessary by the Executive Director for the Executive Director's review and approval. Prior to submitting the plan, to the Executive Director, Caltrans shall also submit copies of the Plan to the reviewing fisheries biologists of the California Department of Fish & Game and the National Marine Fisheries Service for their review and consideration.

The plan shall be based on the "dual metric exposure criteria" set forth below and shall state that exceedance of either criterion, calculated as required herein, shall be deemed lethal to exposed fish and non-compliant with the Conditions of CDP 1-07-013.

DUAL METRIC EXPOSURE CRITERIA

1) Criteria: SEL-accumulated:

A fish receiving an **accumulated Sound Exposure Level (SEL) at or above 187 dB re one micropascal squared-second** during the driving of piles shall be deemed to have received a lethal physical injury. To estimate the sound energy to which a fish is exposed during multiple hammer strikes, NMFS uses the simple summation procedure where $\text{Total SEL} = \text{Single Strike SEL} + 10\log(\text{number of strikes})$.

2) Criteria: Peak SPL:

A fish receiving a **peak sound pressure level (SPL) at or above 208 dB re one micropascal from a single hammer strike** shall be deemed to have received a lethal physical injury.

At a minimum, the Plan shall:

- (1) Establish the field locations of hydroacoustic monitoring stations that will be used to document the extent of the hydroacoustic hazard footprint during pile-driving activities, and provisions to adjust the location of the acoustic monitoring stations based on data acquired during monitoring, to ensure that the sound pressure field is adequately characterized;
- (2) Include provisions for determining whether the fish exclusion zone proposed by Caltrans based on preliminary modeling extends beyond the actual limits of the hydroacoustic hazard footprint associated with the dual metric exposure criteria developed by the National Marine Fisheries Service in 2007;
- (3) Describe the method of hydroacoustic monitoring necessary to continuously assess the actual conformance of the proposed pile-driving with the dual metric exposure criteria up- and down-river of the pile-driving locations on a real-time basis, including relevant details such as the number, location, distances, and depths of hydrophones and associated monitoring equipment;
- (4) Include provisions to continuously record pile strikes in a manner that enables the time of each strike, the number of strikes, the peak sound pressure and other measures of sound energy per strike, or other information required by the Executive Director in consultation with fisheries biologists of the California Department of Fish & Game and the National Marine Fisheries Service, and the interval between strikes to be determined for all pile-driving activities that may produce measurable acoustic affects in the aquatic environment of the Mad River, as well as provisions to supply all monitoring data that is recorded, regardless of whether the data is deemed "representative" or "valid" by the monitor (accompanying estimates of data significance, confounding factors, etc. may be supplied by the acoustician where deemed applicable);

(5) Include provisions for real-time identification (including a method to approximate SEL levels for daily field evaluation of continuing project compliance, provided such method is fully described in the plan to the satisfaction of the Executive Director) and reporting of any exceedance of the dual metric exposure criteria, clear action and notification protocols to stop pile-driving in case of such exceedance, including the authority of the fisheries biological monitor to order pile-driving to stop immediately, and procedures to notify pertinent parties including the Executive Director and other pertinent state and federal agencies immediately after any exceedance of the dual metric exposure criteria. The plan shall additionally provide a complete explanation and illustration of the method used to analyze the cumulative impact portion (accumulated SEL) of the dual metric exposure criteria threshold, and in addition, shall include a complete explanation and illustration of the method used to translate the projections of such impacts to the spatial location of the fisheries exclusion zones within the Mad River Corridor.

(6) Include a monitoring and reporting program that will be coordinated with the fisheries biological monitor and will include provisions to provide daily summaries of the hydroacoustic monitoring results to the Executive Director and to other agencies requesting such summaries, as well as more comprehensive summary reports on a monthly basis during the pile-driving season(s).

(7) Include provisions to monitor pile-driving activities associated with Pier 2 to ensure that such activities, which are not restricted to the July 1 – September 1 pile-driving window associated with Piers 3 and 4, do not exceed the dual metric exposure criteria threshold within the waters of the Mad River, as additionally required pursuant to Special Condition 2.

(8) Include provisions to address how the hydroacoustic monitoring data from the first season of pile-driving will be used to guide the pile-driving activities in the second pile-driving year (adaptive management) to avoid all significant impacts to sensitive species to the maximum extent feasible.

B. Final Hydroacoustic Monitoring Plan

No later than January 1, 2009, Caltrans shall submit a Final Hydroacoustic Monitoring Plan for the review and approval of the Executive Director. The Final Plan shall substantially comply with the draft plan except that it shall take into account new information gained since preparation of the draft plan prepared by Caltrans.

C. Dual Metric Exposure Criteria: Compliance Threshold

(1) Consistent with Caltrans' hydroacoustic impact analyses (Exhibits E, F, & G) that show peak sound pressure level within the Mad River aquatic environment will not exceed 205 dB, the hydroacoustic hazard zone generated by pile-driving a maximum of two 40-foot sections of steel shell piles of 7-foot-diameter per day (See Fish Exclusion Zone E, shown in Addendum Exhibit FF) shall be limited to 150 meters upstream and

150 meters downstream from the pile-driving locations associated with Piers 3 and 4. No other proposed pile-driving activities may generate a hydroacoustic hazard footprint (defined as the exceedance of the dual metric exposure criteria set forth in Special Condition 4(A)(1) and (2)) within the waters of the Mad River. Fish exclusion measures (Special Condition 5) shall be deployed to exclude the maximum feasible number of fish from access to the area of the river established as the applicable Fish Exclusion Zone pursuant to the Caltrans hydroacoustic impact analyses and as identified as Zone E in the Addendum Exhibit FF prepared by Caltrans.

(2) Absent empirical data to the contrary submitted to the satisfaction of the Executive Director, such as evidence from caged fish studies undertaken within the Mad River pursuant to Special Condition 5, all fish subject to exceedance of the dual metric exposure criteria shall be assumed killed.

(3) In the event of an exceedance of either criterion of the dual metric exposure criteria, pile-driving 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 deployment of additional sound attenuation or other measures deemed likely by qualified technical experts to return the pile-driving to conformance with the dual metric exposure criteria;

(4) If the return to pile-driving after the implementation of the additional measures discussed in Subparagraph C(3) above results in an exceedance of either criterion of the dual metric exposure criteria, pile-driving shall be stopped immediately and shall not re-commence until or unless the Commission approves an amendment to CDP 1-07-013 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.

D. Project activities shall be conducted at all times in accordance with the provisions of the final approved plan. Any proposed changes to the final approved plan shall be reported to the Executive Director. No changes to the final approved plan shall occur without an amendment to CDP 1-07-013 unless the Executive Director determines that no amendment is legally required.

CONDITION 5. MAD RIVER FISH AND OTHER AFFECTED SPECIES MONITORING & MITIGATION PLAN.

A. **PRIOR TO ISSUANCE OF CDP 1-07-013**, Caltrans shall submit a **Preliminary Monitoring & Mitigation Plan for Fish and Other Affected Species** subject to the review and approval of the Executive Director. Such plan shall be submitted by Caltrans after their consultation with biologists of the California Department of Fish & Game, the National Marine Fisheries Service, and other pertinent advisors with

expertise regarding the biota of the Mad River or other technical issues associated with the requirements of the Plan. The Plan shall be prepared by qualified biologists with educational background and field experience substantially relevant to the species of concern. The plan shall include at a minimum the following elements:

(1) **Preliminary Information.** All materials related to the potential impacts of the proposed project that have been provided by Caltrans to the California Department of Fish and Game, National Marine Fisheries Service, Regional Water Quality Control Board, Army Corps of Engineers, Environmental Protection Agency, and State Lands Commission since January 1, 2005 in support of the subject project and copies of all final permits, approvals, leases, or other authorizations of or from these agencies shall be attached to the Preliminary Plan as Exhibits.

(2) **Baseline Surveys.** Surveys to acquire comprehensive baseline information about the habitats and all species present in areas of the Mad River corridor that may be affected by the proposed project, or by the mitigation measures implemented in accordance with the provisions of CDP 1-07-013 shall include but not be limited to the following elements:

(a) A survey design developed in cooperation with biologists of the California Department of Fish and Game and the National Marine Fisheries Service and approved by the Executive Director.

(b) Provisions for conducting preliminary surveys during 2008 prior to any disturbance of the Mad River corridor (including the associated riparian vegetation) and refining and repeating these surveys prior to commencement of pile-driving activities in the 2009 and 2011 pile-driving years and other pile-driving years that may arise during project construction that may affect the species that inhabit the Mad River.

(c) Provisions and detailed methods for documenting the types and distribution of physical habitats within the reach of the river from at least 500 meters upstream to 500 meters downstream from the proposed pile-driving locations.

(d) Provisions and detailed methods for documenting, to the extent feasible, the presence, distribution, and relative abundance of all aquatic species within the reach of the river from at least 500 meters upstream to 500 meters downstream from the proposed pile-driving locations.

(e) Provisions and detailed methods for estimating within the reach of the river from at least 500 meters upstream to 500 meters downstream from the proposed pile-driving locations the density and size frequency or age-class frequency of fish by species, habitat type, and location, and the total abundance of fish by species; this provision need not include small species that typically inhabit cryptic habitats.

(f) Provisions for adequate replication and an analysis of the precision of the estimates.

(3) Implementation of a Fish Exclusion Zone (FEZ). Provide a complete description and analysis of all components of the Fish Exclusion Project proposed by Caltrans, including but not limited to the following elements:

(a) A description of the methods of establishing, maintaining, operating, and restoring upon any failure that may occur, the Fish Exclusion Zone and the proposed linear fish migration corridor within the FEZ limits, and a description of all associated development in the Mad River Channel, including "enhancement structures" outside of the FEZ, "temporary augmentation structures" and all other artificial features conceptually proposed by Caltrans in November – December 2007 for placement within the Mad River but deferred by Caltrans for later provision of a detailed project description after Commission approval of CDP 1-07-013.

(b) Provisions and detailed methods for removing fish and other organisms from the FEZ.

(c) Provisions for estimating the number of fish present within the FEZ by species and age - or size- class using the methods developed in section A(2) above. Estimates will be made both before and after the initial fish removal (depopulation) from the FEZ following construction of the fish exclusion barriers and before commencement of pile driving. The number of fish removed will be counted by species and age- or size—class. This information shall be recorded and retained in the project records and pertinent monitoring reports and plans.

(d) Provisions for counting the number of fish by species and age- or size—class, that are removed from the FEZ following repair of the barrier should the barrier fail. The relationships developed in section A (3)(c) above will be used in conjunction with the number of fish removed to estimate the number of fish remaining in the FEZ following the repair of the barrier. This information shall be recorded and retained in the project records and pertinent monitoring reports and plans.

(e) Provisions for adjusting the size and location of the FEZ based on empirical results of the hydroacoustic monitoring and the caged fish study.

(4) Estimation of Losses Due to Project Implementation and Mitigation Requirements.

Provide a description of the methods that will be used to calculate resource losses and compensatory mitigation requirements, including but not limited to the following elements:

(a) Provisions for numerical estimates of losses of fish and compensatory mitigation requirements in terms of adult equivalent fish that would have migrated to spawning areas of the Mad River or tributaries.

- (b) Estimation of the area and periods of loss of habitat that is filled, coffered, or otherwise physically degraded due to project activities.
- (c) Estimation of direct and indirect impacts to fish from pile driving, from capture and transplantation, and from exclusion from the Fish Exclusion Zone.
- (d) Estimation of impacts to species other than fish from project-related activities.

(5) Monitoring the Impacts of Pile Driving on Caged Fish During Project Construction

The Preliminary Plan shall include provisions for determining whether pile driving during project construction results in the mortality or physical injury of caged fish held at various distances from the piling driving location. The Preliminary Plan for monitoring the effects of pile driving on caged fish must be designed to refine preliminary impact assessments developed pursuant to (1) and (2) above with empirical data. The Preliminary Plan shall discuss conceptually and the Final Plan shall include in detail the following elements:

- (a) An experimental design developed in cooperation with biologists of the California Department of Fish and Game and the National Marine Fisheries Service and pertinent experts in academia, and approved by the Executive Director.
- (b) Explicit specification of the statistical design that will be used to analyze the results, a statistical power analysis, and a trial analysis using mock data; the statistical design must be determined in coordination with the development of the physical design that is feasible in the field and will require preliminary, small-scale experiments; replication may be based on individuals, cages, and repeated experiments.
- (c) Provisions for developing protocols and conducting preliminary experiments during the years prior to pile-driving and the first year of pile driving and conducting the definitive monitoring of impacts on caged fish during the second year of pile driving.
- (d) Provisions for peer review of the experimental design prior to development of a final plan.
- (e) The use of locally available hatchery fish.
- (f) The cooperative involvement of experts from California Department of Fish and Game, National Marine Fisheries Service, Humboldt State University, and the University of California, where such experts are available and interested; appropriately supervised HSU graduate students or University of California graduate students should be used for field and laboratory work when feasible and appropriate.
- (g) The inclusion of appropriate controls for handling, transport, caging, and holding fish in the river.

(h) Continuous hydroacoustic monitoring of sound levels immediately adjacent to caged fish during each experimental period so that effects of distance from pile driving can be expressed in terms of received sound pressure levels.

(i) Specification of protocols for handling test animals subsequent to experimental exposure to pile driving, preparation of animals for pathological analysis, and actual pathological analysis.

(j) If the principal investigators selected to undertake the caged fish studies demonstrate, based on preliminary field trials/investigations that the study as contemplated is not feasible due to the physical or chemical conditions of the river or constraints arising from the need to handle and transport fish, the Executive Director may authorize termination of further efforts to undertake the caged fish study otherwise required herein.

B. Prior to Commencement of Construction (other than the test pile work proposed for 2008 at Pier 2, on the pasturelands south of the Mad River)

Caltrans shall submit a Final Monitoring Plan for the review and approval of the Executive Director that incorporates (1) the results of the baseline surveys, (2) revisions to the Fish Exclusion Zone proposal incorporating the results of the baseline surveys and other pertinent new information, (3) revisions of the estimation of losses of fish from project implementation and mitigation requirements based on the results of the baseline surveys and other pertinent new information, (4) revisions to the caged fish study that incorporate the results of the peer review of the caged fish study required by subsection (5)(d) above, (5) provisions for how caged fish study data will be used for adaptive management purposes, and Caltrans shall submit the Final Monitoring Plan for the Executive Director's review no later than January 1, 2009 and shall not commence any activities that would affect the subject areas of the Mad River and environs until Caltrans receives evidence of the Executive Director's review and approval of the Final Monitoring Plan.

C. No later than March 1 of the year following the first pile-driving season, a Final Revised Monitoring Plan that addresses the effects of pile driving on caged fish shall be submitted for the Executive Director's review and approval that incorporates the results of the peer review of the first pile-driving season. Caltrans shall not commence any additional pile-driving activities until Caltrans receives evidence of the Executive Director's review and approval of the Final Revised Monitoring Plan.

D. Final Fisheries and Other Affected Species Compensatory Mitigation Plan:

Not later than October 1 of the year of the second pile-driving season (presently projected as October 1, 2011), Caltrans shall submit a complete analysis of the affects of the subject project on the sensitive species and habitat of the Mad River based on the data collected during project operations in accordance with Conditions 4 and 5, and shall submit a Final (complete) application for an amendment to CDP 1-07-013 for Long

term compensatory Mitigation of fisheries impacts associated with all aspects of the subject project, including pile-driving, that have adversely affected the fisheries of the Mad River. The long term compensatory mitigation plan shall mitigate, to the maximum extent feasible, all significant direct and indirect impacts to fish from pile driving, capture and transplantation, and from exclusion from the Fish Exclusion Zone, as well as significant impacts to species other than fish from project-related activities.

CONDITION 6. BIOLOGICAL MONITORING: FISHERIES

A. Timing and focus of fisheries monitoring:

The biological monitor for fisheries shall not be responsible for other biological monitoring/permit compliance assurance duties related to other aspects of the project construction. At least one fisheries biological monitor shall be present during construction activities undertaken during the May 1 – October 15 season and the monitor shall make periodic inspections of the job site not less than weekly during the October 15–May 1 construction season to ensure that water quality standards protective of the Mad River are being met. During the July 1 – September 1 pile-driving season, two fisheries biological monitors shall be present during project construction, and one shall be dedicated exclusively to monitoring pile-driving activities. Pile-driving shall not proceed unless the pertinent fisheries biological monitor is present pursuant to the requirements of Special Condition 2.

B. Selection/Qualifications:

Monitors selected as fisheries biological monitors shall have at least a Bachelor's degree in biology, including significant coursework in fisheries biology and relevant field experience with salmonid fisheries. The monitors selected shall be qualified to capture and release impounded salmonids. The qualifications of candidates under consideration shall be reviewed and approved by the Executive Director and the fisheries biologists of the California Department of Fish and Game and the National Marine Fisheries Service.

C. Duties:

The fisheries biological monitor(s) shall have the lead responsibility for ensuring that all project activities are undertaken in full compliance with the requirements of CDP 1-07-013. The fisheries biological monitors shall also brief on-site personnel on the requirements of such compliance and shall keep records of such briefings and the identities of attending personnel. The biological monitor shall instruct and direct the resident engineer or other site supervisors and construction personnel in all applicable measures necessary to avoid direct or indirect adverse impacts to fish. Until compliance is achieved, it shall be the responsibility of a designated Caltrans site supervisor, who may be the resident engineer, **to stop work**, or to direct immediate remedial measures to return the project activities to compliance at any time the fisheries biological monitor indicates that the pertinent work is not in compliance with the requirements set forth in the applicable permits and approvals, and that such non-compliance jeopardizes the water quality, or the health of fish, in the Mad River. A

Caltrans site supervisor shall be designated for such purpose for each day of construction and such information shall be readily available and posted at the site. The posting shall indicate that **if the designated site supervisor is not immediately available to stop work upon the request of the fisheries biological monitor, the fisheries biological monitor shall have the authority to stop work immediately without waiting for the arrival of the designated Caltrans supervisor.** It shall be the responsibility of all designated Caltrans supervisors to fully affirm this responsibility and authority to all construction personnel on the subject project site.

The fisheries biological monitor shall also verify compliance with water quality requirements of CDP 1-07-013, particularly those pertaining to water quality standards and site-specific water quality objectives established for the Mad River and defined in the Water Quality Control Plan for the North Coast Region (Basin Plan), including pertinent pH and turbidity limits, and with the approved SWPPP, and with requirements prohibiting the discharge of debris, chemicals, and other unauthorized materials to the stream channel, or to locations that drain to the stream corridor.

The fisheries biological monitor's primary duty is to monitor project activities that may affect fisheries or aquatic habitat, and the fisheries biological monitor shall therefore not be required to undertake other duties that are required of the general biological or water quality monitoring staff that may be required by other special conditions of CDP 1-07-013 or by other Caltrans requirements.

The biological monitor shall record and report any significant briefings, instructions or directions provided to site personnel, and shall record any incidents and/or corrected incidents that had the potential of non-compliance with permit conditions, whether verified yet or not, in the pertinent daily monitoring log. The biological monitor shall also timely enter into the subsequent records the manner in which non-compliance was resolved and the pertinent facts, including before- and after-incident photographic records whenever feasible.

D. Notification and reporting:

(1) Non-compliant work shall be stopped immediately by the designated Caltrans supervisor, or by the biological monitor if the designated site supervisor is not available, if non-compliance with permit conditions is determined by the fisheries biological monitor, and such continued non-compliance could adversely affect fish within the Mad River. Work shall also be stopped immediately if any fish injury or mortality is observed outside the approved Fish Exclusion Zone that could reasonably be considered to be related to project activities, whether such activities are compliant with permit conditions or not. The fisheries biological monitor shall additionally provide direct, immediate verbal notification of such observations/actions to the designated fisheries biologists of the California Department of Fish and Game and the National Marine Fisheries Service, and to the Executive Director. The subject activities shall not re-commence thereafter unless the Executive Director, in consultation with the fisheries biologists of CDFG and

NMFS determines that such work is compliant with the Special Conditions of CDP 1-07-013 and the adverse affects on fish have been resolved to prevent further injury.

(2) The fisheries biological monitor shall prepare daily monitoring logs that in addition to regular monitoring reports also include information requested by the Executive Director and by the fisheries biologists of CDFG and NMFS, and shall submit the logs daily by e-mail or facsimile to the Caltrans Resident Engineer and Environmental Liaison, and daily to the Executive Director and to the fisheries biologists of CDFG and NMFS or as frequently as they may request, and to other state and federal agency staff that may request such reports, during the July 1 – September 1 pile-driving season. Monitoring logs shall be submitted weekly to the same parties, and in the same manner, during the remainder of the year. The fisheries biological monitor shall also ensure that the hydroacoustic monitoring daily logs are submitted with the biological monitoring reports and that the day's hydroacoustic monitoring log is submitted concurrently with the day's biological monitoring log to the pertinent Caltrans staff, the Executive Director, and to other agency staff as the agencies may request. Should the Executive Director request additional monitoring information based on project circumstances that may arise during the course of the proposed project construction, the additional information shall be collected by the fisheries biological monitor and/or other Caltrans personnel as applicable and included in the pertinent monitoring logs.

CONDITION 7. CONSTRUCTION RESPONSIBILITIES.

A. This permit authorization requires, and by accepting the benefits of CDP 1-07-013, Caltrans agrees that:

- 1) No construction materials, debris, graded soils, waste, chemicals, fuels, or non-compliant dewatering effluent (effluent with turbidity, pH, or other water quality measure that does not comply with the requirements of the Regional Water Quality Control Board or other state or federal agencies), shall be stored, placed, or discharged within the Mad River corridor including streambed or banks, or adjacent riparian areas, or other areas where it may enter the Mad River or other coastal waters, whether directly or indirectly, unless specifically and affirmatively authorized by these special conditions; and
- 2) No machinery shall be allowed at any time within the wetted channel of the Mad River corridor except during the construction windows specifically authorized by Special Condition 1.
- 3) The Executive Director may, through these provisions, authorize the limited use of equipment within the wetted channel during the season June 16 through October 14 annually, for the purpose of: a) constructing the temporary river crossing in years where such crossing is necessary, b) diverting the river channel as necessary provided the flowing channel is never reduced to less than fifty feet in continuous flowing channel width, and c) constructing the mitigation scour pool in Construction Year 3 or 4. Such

authorization shall be provided through the Executive Director's approval of an annual river access plan that shall be submitted by Caltrans for the review and approval of the Executive Director not later than February 1, annually, for the following May 1 – October 14 season, or by May 1 annually if the river access plan will only address the June 15-October 16 access provisions, to allow sufficient time for iterative executive review and revision of the subject plan. The Executive Director shall review the subject plan in consultation with the fisheries biologists of the California Department of Fish and Game and the National Marine Fisheries Service. The Executive Director may authorize minor changes to the approved annual river access plan that Caltrans requests based on the fluctuating seasonal conditions of the river channel that become more pronounced as the rainy season ends, provided that no significant additional impacts to sensitive species or habitat would result from the proposed changes. The annual river access plan shall address all areas of project activities authorized by CDP 1-07-013 and shall provide a refined plan based on the emerging river conditions and construction needs of the subject year for which the plan is proposed. The annual river access plan shall be prepared by the supervising and resident Caltrans engineers assigned to the subject project, together with the fisheries monitoring biologist and a Caltrans environmental planning staff biologist. The annual river access plan shall not be implemented without the final review and approval of the revised plan incorporating all changes required by the Executive Director.

4) Vehicles, equipment and materials allowed on the gravel bars in the river channel shall be limited to the minimum necessary to perform project activities. If the Caltrans site supervisor determines that this requirement is not met, the supervisor shall direct that the excess be immediately re-located outside of the river channel. No vehicles, equipment or materials, except as specifically authorized in the annual river access plan, shall be allowed within the ambulatory wetted channel of the river. Fueling on the dry gravel bars of the channel shall be subject to all BMPs and over-water fueling procedures that set the highest possible standards for fuel containment and spill response readiness, and shall be limited to major tracked vehicles such as cranes and stationery equipment such as generators and pumps that cannot feasibly be relocated outside of the corridor for fueling, with full containment of any potential fuel spill in place prior to commencement of any re-fueling operation, and verified by the fisheries biological monitor. All hydraulic fuels used within the river corridor shall be vegetable-based unless determined infeasible by the Caltrans site supervisor, who shall note such determination in the project records. Generators and other potential sources of fuel or oil spills shall be fully contained to prevent spills or leakage onto the gravel bar and shall be inspected at least twice per day for evidence of leaks or spills. No fuels shall be stored closer to the channel than the area defined as a minimum of one hundred (100) feet landward of the top-of-bank of the Mad River, and all fuels, oils or other potential contaminants shall be stored within areas protected by berms sufficient to contain the maximum spill that could occur within the bermed area and authorized for such placement, and in a manner that prevents spills or leaks from reaching the river corridor. Any leaks or spills anywhere on the subject site shall be cleaned up immediately and noted in the SWPPP reports and pertinent biological monitoring reports.

5) Staging and storage of construction machinery, materials, equipment, fuel, or any other material, or storage of debris or graded material, shall not take place within sensitive habitat areas or within the river channel except as specifically provided in these special conditions, and the perimeters of sensitive habitat areas shall be identified and marked in the field by a qualified biologist prior to commencement of construction and re-identified as often as needed thereafter to continuously maintain the identification and protection of sensitive habitat areas.

6) Demolition of the existing bridge or roadbed shall not be undertaken through the use of explosives, and no portion of the existing bridges may be demolished in a manner that allows debris to fall into the waters of the Mad River or onto the native gravel bar. Construction debris shall be picked up from the bridges or debris-capture structures suspended from the bridges or other supports, and removed without use of the channel below as a landing for debris and other construction wastes and the channel may not otherwise be used for demolition except as authorized to stage the cranes and other equipment in use for demolition activities above the corridor. All construction debris generated by demolition activities shall be captured from the deck of the existing bridges, or from temporary structures or devices suspended below and/or adjacent to the structures being demolished, to capture the debris, even if this requires some traffic delays, rather than resorting to the method of allowing the debris to be dropped to the river corridor for retrieval there. Visible amounts of concrete dust and small rubble shall not be released into the air or water during construction and dust suppression measures shall be implemented. Dust control via water spray shall be implemented in a manner that does not generate excess water runoff into the river and shall be monitored by the fisheries monitoring biologist or the monitor's designated assistant or other biological monitor, so that excessive water contaminated by concrete dust does not drain into the banks, channel, or waters of the river. No portion of the demolition debris shall be allowed to enter the Mad River corridor at any time.

7) All debris, materials, equipment, vehicles, staging and storage features, concrete washout areas, de-watering facilities, the bermed fueling/fuel storage location, and any other material or temporary feature associated with project construction shall be removed immediately after project completion and the affected area returned to pre-construction conditions and restored in accordance with other special conditions set forth herein.

8) All waste material or excess graded material generated by demolition or construction shall be removed from the construction site and disposed of at a facility that is:

- a) located outside of the Coastal Zone, with necessary permits and approvals to accept the material for disposal or recycling, or
- b) inside the Coastal Zone at a facility demonstrated by Caltrans to the satisfaction of the Executive Director to have all necessary permits and approvals, including a coastal development permit where applicable, for such use. The location and volume of project wastes so disposed shall be documented by the resident engineer and noted

in the biological monitoring reports submitted to the Executive Director. The disposal records shall be retained by Caltrans as part of the permanent project files and made available on request.

9) All lead-contaminated soils that will be disturbed in the areas east of the existing bridges shall be excavated and removed prior to any other disturbance of these areas (northeast quadrant of the proposed project site) only to the depth of the lead contamination concentrations that qualify for disposal as hazardous wastes, and shall not be commingled or otherwise diluted by mixing the contaminated soils with other soils or materials. The lead-contaminated soils shall immediately be segregated through placement into appropriate containers for shipping and disposal as hazardous wastes, and shall be removed from the site for disposal at a licensed facility authorized to accept hazardous wastes immediately thereafter. The hazardous waste containers shall be logged and the record of final disposal maintained by the Caltrans supervising engineer and provided to the Executive Director within sixty (60) days of such disposal. The resident and supervising Caltrans engineers shall report the excavation and disposal to the biological monitor who shall record these reports in the biological monitoring reports required by the Special Conditions of CDP 1-07-013. Caltrans shall prepare an as-built site plan showing the location and extent of the excavation of lead contaminated soils at the same scale as the wetland mitigation plans proposed for Caltrans for installation at the affected locations after associated grading has been completed. The as-built site plan shall be submitted to the Executive Director within sixty (60) days of completion of the removal of the lead contaminated soils with an attached copy of the final wetland mitigation plan for the same location, demonstrating that the subject location will be free of hazardous lead contaminated soil and demonstrating that the subject location will be at or below background concentrations of lead as established by the Kearny Foundation of Soil Science, Division of Agriculture and Natural Resources, University of California published report, "Background Concentrations of Trace and Major Elements in California Soils (also available on the internet at : <http://www.envisci.ucr.edu/downloads/chang/kearney/hearneytext.html>.) The location and volume of project wastes so disposed shall be documented by the resident engineer and noted in the biological monitoring reports. The disposal records shall be retained by Caltrans as part of the permanent project files and made available on request.

10) Fueling shall take place in a single designated offsite area that is bermed and otherwise set up to fully contain any potential spill without release outside of the designated area, and the designated area shall be continuously equipped with all materials necessary to control and cleanup any spill that may occur. The integrity of the containment berm and the readiness of control and cleanup materials and equipment shall be periodically verified by the Caltrans site supervisor and noted in the permanent project records. The designated fueling/fuel storage area may not be located closer to the Mad River corridor than a minimum of 100 feet landward from the top of bank. Only equipment that cannot be readily relocated to the designated offsite fueling location may be fueled in other areas of the site (cranes, large tracked vehicles and stationery equipment only) and these shall be re-fueled only by a California Department of Fish

and Game-certified over-water re-fueler, in a manner authorized in accordance with all requirements of the Department of Fish and Game and the Regional Water Quality Control Board, including but not limited to the requirement that such re-fueling be undertaken by a minimum of two crew members certified for such operations, with one on standby to shut off the flow of fuel and the other at the delivery point, in constant communication with each other, with full deployment of absorbent pads with sufficient capacity to absorb the maximum amount of fuel that could escape from the fueling hose before shutoff occurs in the event of equipment failure. No fueling of any kind may take place anywhere on site except during daylight hours and when visibility is sufficient for the re-fueling crew to maintain visual contact.

11) Sufficient oil absorbent booms and/or pads shall be on site at all times during project construction to ensure an immediate, effective response to any spill that may reach the Mad River. Site personnel shall be verified as fully trained to deploy such equipment, and the presence of the booms/pads/equipment and the adequacy of personnel training shall be periodically verified by the Caltrans site supervisor and noted in the permanent project records. All equipment used during construction shall be free of oil and fuel leaks at all times, and where parked or operated within or over the river channel from top of bank to top of bank, oil pans or other containment materials or devices shall be continuously placed beneath such equipment to ensure that leaks that do arise will not enter the river environment. Vehicles or machinery cleared to enter the wetted channel, such as for construction of temporary crossings, shall be fully steam-cleaned, including the undercarriage, and inspected and verified to be free of leaks by the Caltrans site supervisor or designated representative before the subject vehicles or machinery are allowed to enter the wetted channel. No vehicles or machinery shall enter the wetted channel at any time unless under the constant supervision of the monitoring fisheries biologist and the Caltrans site supervisor.

12) Cement/concrete shall be prepared and poured or placed in a manner that will prevent discharges of wet cement, or waters that have been in contact with cement/concrete, into coastal waters. Such measures include but are not limited to placement of measures such as catch basins, mats or tarps beneath the construction area to prevent spills or overpours from entering coastal waters, and use of Baker Tanks to collect, test and potentially treat contaminated de-watering effluent. De-watering of effluent that has been in contact with cement/concrete or other potential contaminants shall not be de-watered into coffer dams or sediment basins within the river channel, or discharged directly into the Mad River or its tributaries. De-watered effluent that has been in contact with uncured cement or other potential contaminants shall only be pumped to the de-watering locations authorized for the non-riparian pasturelands upgradient from the river corridor and where such effluent will soak into the subject lands and will not run off into the Mad River or its tributaries, whether directly or indirectly.

13) Construction de-watering during the period defined annually as June 16 through October 2 may involve construction of a de-watering basin within the dry native gravel bar. The temporary basin must be located a sufficient distance from the nearest edge

of the wetted channel to ensure sufficient filtration of discharged effluent to protect the water quality of the Mad River as advised annually by the Caltrans environmental engineer/water quality manager based on emergent river conditions. The sediment basin must be located within the area of the river that is within the pertinent Fish Exclusion Zone (FEZ) established in active pile-driving seasons, when a FEZ is required pursuant to other special conditions set forth herein. The temporary sediment basin must include a filter fabric lining (or equivalent) to prevent the release of fines to the Mad River. The use of a temporary sediment basin during the pertinent season must include a monitoring program that includes monitoring of the dewatered effluent discharged to the temporary sediment basin, and upstream and downstream monitoring. Upstream and downstream monitoring points must be located no more than a maximum of fifty (50) feet from the temporary sediment basin location. A complete constituent list, monitoring frequency, and standards for water quality compliance shall be developed in the project SWPPP and reviewed and approved by the Caltrans environmental engineer/water quality manager prior to the SWPPP submittal to the Executive Director for review and approval.

14) Construction de-watering effluent produced during the October 3 through June 15 period annually (wet weather season for purposes of interpreting this provision), shall not be discharged at any location within bank to bank (within the river corridor) of the Mad River or its tributaries. If adjacent pasture fields are used for construction de-watering, all de-watered effluent shall be fully contained. Construction de-watering shall not result in standing water that persists for more than 72 hours. Areas used for construction de-watering shall be explicitly delineated on map layouts and these map layouts shall be incorporated into the project SWPPP. The use of a temporary sediment basin pursuant to subparagraph 13) above shall include a monitoring program that includes monitoring of the dewatered effluent discharged. A complete constituent list, monitoring frequency, and standards for water quality compliance shall be developed in the project SWPPP and reviewed and approved by the Caltrans environmental engineer/water quality manager prior to the SWPPP submittal to the Executive Director for review and approval.

15) Rinsate from the cleaning of equipment, including cement mixing equipment, shall be contained and handled only in upland areas where drainage to coastal waters is fully prevented, and otherwise outside of any environmentally sensitive habitat area or wetland or buffers thereto.

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

17) All forms that may be utilized for wet concrete/cement pours shall be grout-sealed, or the equivalent, to prevent release of concrete/cement, and the grout shall be allowed to cure adequately and be water-tested under the supervision of the fisheries or general biological monitor and the resident engineer to ensure complete seal before any wet concrete/cement or other chemical treatments may be applied to the forms. No

placement/pour of concrete/cement within or above the river channel from top of bank to top of bank, including within de-watered coffer dams, shall occur unless the fisheries biological monitor is present.

18) No vegetation removal, including clearing, grubbing, limbing, trimming, or other disturbance of existing vegetation may occur between March 1 and August 31 of any year unless a qualified biologist provides a survey undertaken to the satisfaction of the Executive Director not less than ten (10) days prior to proposed commencement of such activities, demonstrating conclusively that no birds are nesting in the area that would be affected, and the results of the survey have been provided to the Executive Director's satisfaction not less than five (5) days prior to proposed commencement of such activities, and the vegetation removal has additionally been authorized by a California Department of Fish and Game biologist familiar with the bird species likely to nest in the subject area.

19) Exclusionary netting shall not be used. Nesting that would be affected by project activities shall be discouraged by timely removal of attempted nests which must be performed by, or performed under the direct supervision of, a qualified biologist. Such activities shall be logged by the pertinent biological monitor. Nesting shall be allowed on any structure that is not scheduled for demolition during the forthcoming nesting season and the contractor shall be required to schedule demolition outside of the nesting season unless Caltrans demonstrates to the satisfaction of the Executive Director that such delay would imperil the project schedule to the extent that an additional year of site disturbance could result.

20) Placement of temporary Rock Slope Protection and other slope stabilization measures annually, before October 15, may be authorized by the Executive Director if no more effective method of erosion control is available. The preferred method of erosion control shall be the anchored placement of geotextiles and mulch provided these would be stable and would not contribute to discharge into the river waters during the rainy season. If RSP is used, the RSP must be placed, removed, and stored annually in compliance with the other provisions of CDP 1-07-013 and must be finally disposed in accordance with the waste disposal provisions of this Special Condition. No RSP may be placed permanently within the bed and banks, from top-of-bank to top-of-bank of the river channel, except as specifically shown on the proposed project plans for the areas of the new bridge abutments that are located above the 100-year flood plain. No permanent placement of RSP below the limits of the 100-year flood plain is authorized by CDP 1-07-013 except for the construction of the scour hole that will be constructed after pile-driving has concluded, in accordance with the mitigation required by the National Marine Fisheries Service for loss of the scour hole at the existing bridge pier. RSP and other materials such as woody debris shall be placed in accordance with plans and provisions authorized by the Executive Director in consultation with the fisheries biologists of the NMFS and the California Department of Fish and Game.

B. All project activities shall be undertaken at all times in full compliance with these requirements. Any project changes to these requirements shall be reported to the

Executive Director. No changes to these requirements may be approved without an amendment to CDP 1-07-013, unless the Executive Director determines that no amendment is legally required.

CONDITION 8. FINAL REVEGETATION and EROSION CONTROL PLAN ASSOCIATED WITH CONSTRUCTION

PRIOR TO ISSUANCE OF CDP 1-07-013, Caltrans shall submit for the review and approval of the Executive Director, a Final Revegetation and Erosion Control Plan for all areas disturbed by construction other than those areas associated with implementation of the riparian wetland mitigation proposed on and offsite, including access roads, staging and storage areas and any other areas disturbed by project activities.

A. Plan Contents

- 1) The plan shall be prepared by a qualified botanist with knowledge of the flora of the Mad River and environs. The plan shall provide for both temporary and permanent erosion control and revegetation utilizing only regionally appropriate or locally grown or collected native plant seeds or materials, except for areas that will be returned to agricultural use. Agricultural areas shall be replanted or reseeded as appropriate, in accordance with the existing vegetation or crop cultivated by the affected property owner. The plan shall set forth revegetation performance standards and milestones to ensure the ecological and erosion control success of the plantings subject to the review and approval of the Executive Director.
- 2) All proposed plantings other than for the areas being returned to agricultural use shall be obtained from local genetic stocks within Humboldt County. The Executive Director may authorize limited, minor exceptions to this standard upon a showing of evidence to the Executive Director's satisfaction that locally obtained materials are not available. In no case shall plant species listed as problematic and/or invasive by the California Native Plant Society, the California Invasive Plant Council, or by the State of California be planted or allowed to naturalize or persist on the parcel. No plant species listed as a 'noxious weed' by the State of California or the U.S. Federal Government shall be utilized within the property.
- 3) The plan shall include a site plan to scale with a detailed planting plan, including provisions for replacing the fourteen mature Monterey Pines removed for construction of the southbound Central Avenue off-ramp.
- 4) Plantings shall be installed during the optimal season for plant survival and establishment, in the year following completion of construction, and shall be watered as necessary thereafter until fully established.

- 5) All disturbed soils shall be secured by erosion control measures before and during the rainy season, and permanent plantings shall be protected with slope stabilization measures until sufficient cover and root mass ensures that erosion is fully controlled.
- 6) Weed control measures shall be implemented throughout the disturbed areas of the site subject to revegetation, for a minimum of five (5) years following the end of construction, and annual removal of Himalayan blackberries throughout the right-of-way areas of the subject project boundaries shall be included in the weed control efforts.
- 7) The permittee shall submit annual monitoring reports and photographs documenting the progress of revegetation of the site in accordance with the approved success criteria and milestones, and shall implement any adaptive management or replanting measures necessary to achieve final project success for a minimum of five (5) years of follow-up monitoring and adaptive management after the last post-construction plantings or significant adaptive management measures are installed.
- 8) All revegetation activities, including monitoring, adaptive management, and reporting, shall be undertaken or supervised by a qualified botanist.
- 9) All plantings shall be maintained in good condition for the life of the development approved by CDP 1-07-013, and shall be watered, weeded, replaced, and otherwise maintained by Caltrans as necessary to achieve and maintain this standard. It shall be the responsibility of Caltrans to repair and remediate any erosion that occurs in any area disturbed during the construction or operation of the development approved by CDP 1-07-013 for the life of the approved project.

B. Livestock Crossing Erosion Control: The plan shall include a fenced cattle/equipment crossing corridor under the new bridges that is wide enough to allow farm equipment to cross beneath the bridges to access either side of the adjacent agricultural parcel on the north side of the bridges. The crossing shall be designed to exclude cattle from the riparian wetland mitigation plantings and buffers provided for in the restoration plans, and the crossing shall include mud and runoff control, water collection/drainage tiles/culverts/sediment basins/ vegetated swales or other similar measures in a combination sufficient to ensure that runoff from the crossing does not drain into the adjacent Mad River. The livestock crossing shall be wide enough for equipment but shall be designed to discourage the congregation of cattle for feeding/sheltering purposes and avoid erosion and the concentration of mud and manure beneath the existing bridges, within the Caltrans right-of-way. Caltrans shall ensure that the bridge undercrossing is not used as an ad-hoc livestock barn/feeding area that causes livestock wastes to accumulate in concentrated areas under the bridges. Caltrans shall include the future maintenance and management of these structures in the drainage management plan required in the special conditions of CDP 1-07-013, and shall coordinate the limitation on the use of the bridge undercrossing and the maintenance of the structures with the owner of the adjacent agricultural lands.

C. Pedestrian Landings. The plan shall include aesthetic treatment/landscaping, and erosion control measures associated with the pedestrian landings at each end of the multi-modal corridor on the northbound bridge. The plan shall include provisions for the long-term maintenance of these features, including maintaining the landscape in good condition (including weeding, watering, replanting, etc. as necessary to achieve this standard) for the life of the development approved pursuant to CDP 1-07-013, including the pedestrian landings off each end of the northbound bridge.

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

CONDITION 9. DRAINAGE STRUCTURE FINAL PLAN; MAINTENANCE RESPONSIBILITY.

A. PRIOR TO COMMENCEMENT OF CONSTRUCTION but not less than a minimum of 120 days prior to implementation of any work affecting culverts that will be installed or improved at the project site, Caltrans shall submit for the review and approval of the Executive Director, a final plan for drainage structure design and long-term management in any area of the project that is subject to CDP 1-07-013, including maintenance of hard structures and vegetated swales or similar landscape features designed to capture, slow, and/or treat stormwater runoff, protect coastal water quality, and control erosion. The Plan shall include but not be limited to the following requirements:

(1) Methods to filter highway effluent that would otherwise carry oil and grease and other contaminants into the waters of the Mad River. The plan shall include features for erosion control and water filtration at all culverts that will be installed or improved at the project site.

(2) Measures to ensure that the culverts that will be installed or improved as part of the subject development are made as suitable for the use or passage of wildlife that typically visit the subject area, as is feasible, including amphibians, reptiles, and small and large mammals as applicable. The culvert features shall be evaluated for compliance with this requirement by a biologist qualified to evaluate the suitability of such structures for wildlife passage and use. The biologist shall evaluate and recommend the ideal size of the structure, design, including interior features, inlets/outlets, bottom design/placement, etc. that may facilitate use by wildlife.

(3) Provisions for long-term culvert maintenance to ensure that the culverts that will be installed or improved at the project site provide maximum water quality protection and wildlife passage suitability after construction is completed. The final plan shall include a maintenance schedule and statement of responsibilities.

B. If the project's surface or subsurface drainage structures fail or result in erosion, Caltrans shall be responsible for all necessary repairs to drainage structures and such repairs and necessary restoration of the affected areas shall be undertaken in a timely manner and in compliance with any applicable permits or authorizations that may apply to such activities.

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

CONDITION 10. WATER QUALITY PROTECTION.

A. Caltrans shall conduct the limited amount of vegetation clearance and site disturbance necessary to undertake the pile load testing southwest of the proposed bridges, in the general area of proposed Pier 2, in full compliance with the limited plan for Best Management Practices submitted by Caltrans. The vegetation removal and the pile load testing at Pier 2 shall be undertaken after September 1, 2008 and the vegetation removal shall not exceed that shown in the crosshatched area identified in Addendum Exhibit GG. Minor trimming of vegetation overhanging the existing road, but not vegetation beyond such overhang, may be undertaken along the existing access road immediately west of Wymore Road for the purpose of accessing the construction site. No access to, or modification of the bed and banks of the Mad River is authorized pursuant to Subparagraph A herein.

B. Not later than July 1, 2008, or within such additional time as the Executive Director may grant for cause, Caltrans shall submit for the review and approval of the Executive Director a Phase I Storm Water Pollution Prevention Plan (SWPPP) that shall be comprehensive in scope but shall apply only to the pile-load testing activities Caltrans proposes to undertake after September 1, 2008 at the proposed Pier 2 location shown on Addendum Exhibit GG. If any de-watering is necessary to undertake the subject work addressed by the Phase I SWPPP, then the effluent produced by such de-watering shall be discharged only to pasturelands in the southwestern quadrant of the subject project area. Any excess effluent that cannot be absorbed by the treated pasturelands shall be temporarily contained in storage tanks or other upland containment within the southeastern quadrant pasturelands until sufficient evaporation or percolation has occurred. No discharge to the Mad River for activities subject to the Phase I SWPPP shall occur unless the Executive Director approves an amendment to the Phase I SWPPP upon a showing of evidence to the Executive Director's satisfaction that all water quality standards protective of the waters of the Mad River will be met. The Executive Director shall determine whether the Phase I SWPPP is adequate to control erosion and to prevent contamination of the waters of the Mad River and associated damage to sensitive species during the proposed pile-testing activities

undertaken after September 1, 2008. Proposed activities subject to the provisions of the Phase I SWPPP shall not commence until the Executive Director's approval has been granted.

C. Not later than October 1, 2008, or within such additional time as the Executive Director may grant for cause, Caltrans shall submit for the review and approval of the Executive Director a complete Phase II SWPPP for all other project activities not covered by the Phase I SWPPP. The Executive Director shall determine whether the SWPPP is adequate to control erosion and to prevent contamination of the waters of the Mad River and associated damage to sensitive species during the proposed construction period pursuant to CDP 1-07-013. If the Executive Director determines that the SWPPP is not adequate for this purpose, project activities other than those specifically authorized by Subparagraph A above shall not commence until all changes required by the Executive Director have been made and published in a revised SWPPP to the satisfaction of the Executive Director. Caltrans shall allow a minimum of thirty (30) days for the final review by the Executive Director for the purpose of determining that all previously requested changes to the draft Phase II SWPPP have been made. It shall be Caltrans' responsibility and the responsibility of the pertinent contractor to ensure that the draft SWPPP is prepared and submitted on a pre-construction timeline that allows for the full sequence of this iterative review, which could require at least 120 days, or longer if substantial changes to the draft SWPPP are necessary.

D. In addition to other requirements set forth in this or other special condition(s) set forth herein, the Phase II SWPPP shall specifically develop a construction de-watering plan for both dry weather and wet weather seasons. For purposes of interpreting provisions of these special conditions pertaining to construction de-watering requirements, the dry weather construction season shall be defined in accordance with the standards of the North Coast Regional Water Quality Control Board as May 1 to October 1, annually, and the wet weather construction season shall be defined as October 2 to April 30, annually. The construction de-watering plan shall discuss methods, a monitoring program, and corrective actions that may be necessary, that is specific for both the dry weather and wet weather seasons, the pasturelands become so saturated that the effluent cannot filter adequately, project activities requiring de-watering shall be stopped until adequate infiltration capacity has been restored. Nothing in these provisions shall authorize alternative de-watering through the use of any structures such as coffer dams within the wetted channel of the Mad River.

E. In addition to the other requirements of this or other special condition(s) set forth herein, the Phase II SWPPP shall contain specific Best Management Practices (BMPs) for work undertaken during the May 1 – June 15 time period annually as authorized in Special Condition 1(A) *et. seq.* above. These BMPs shall address the specific activities proposed within the river corridor during this annual window of time and shall provide BMPs adequate to ensure the protection of the water quality of the Mad River if unexpected precipitation occurs while such activities are underway.

F. Drilling muds or spoils associated with foundation installation, coffer dam excavation or other project activities shall be removed immediately from the river corridor and de-watered or disposed outside of the area of the corridor defined for purposes of interpreting the requirements of this special condition as any location closer to the river than a minimum of 100 feet landward of the top of bank of the river. No effluent from such de-watering shall be allowed to reach the banks or bed of the Mad River at any time, and should such release occur, the project shall be shut down immediately until the discharge has been contained and fully resolved. Should such discharge occur, the discharge shall be immediately reported to the Executive Director and to the fisheries biologists of the California Department of Fish and Game and the National Marine Fisheries Service, and to the appropriate representative of the Regional Water Quality Control Board.

G. De-watered effluent that will be generated by activities associated with maintaining coffer dams, drilling, sediment de-watering, or pile-driving and related work, shall not be directed into coffer dams in the river channel.

H. The Phase II SWPPP may additionally include a construction de-watering plan that relies on discharge to a SEDIMENT BASIN constructed within the dry native gravels of the river bar. The plan for use of a sediment basin shall specify that such basin may only be used annually from June 16 – October 14, and may only be used for discharge of de-watering effluent that has not come into contact with uncured concrete or other potential contaminant. The plan shall specify a setback from the outer boundaries of the sediment basin to the nearest edge of the wetted channel that is deemed sufficient by the Caltrans environmental engineering/water quality staff to provide adequate filtration of effluent discharge protective of the waters of the Mad River. The plan shall require that the sediment basin be lined with filter cloth to prevent discharge of sediment contamination to the waters of the river. The plan shall require the removal of all sediments and filter cloth prior to re-grading of the sediment basin at the end of the annual construction season. The plan shall require that the sediment basin be removed and re-graded in accordance with the pertinent annual construction access plan or as the fisheries biologists of the National Marine Fisheries Service and the California Department of Fish & Game may direct. No de-watering within the river corridor shall be allowed unless undertaken in accordance with these requirements.

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

CONDITION 11. BIOLOGICAL MONITORING (non-fisheries).

A. Caltrans shall provide daily monitoring of all project activities for compliance with all conditions of CDP 1-07-013 including those that require separate monitoring by the

fisheries biological monitor(s). A biological monitor, a qualified Caltrans construction liaison or environmental planner who is also a biologist, shall monitor and record site conditions and environmental baseline information, removal and packaging of lead-contaminated soils for hazardous waste disposal, potential exposure of cultural remains during excavation (the biological monitor shall seek the assistance of a qualified Caltrans archaeologist for this purpose), SWPPP monitoring report accuracy and completeness, and shall maintain and submit daily logs to the Executive Director, and to state and federal agency staff requesting such submittals. The biological monitor shall also be responsible for timely notifying the pertinent parties (within 24 hours or less of the potential non-compliance) of any instance of non-compliance with permit conditions, or any other occurrence that threatens to materially jeopardize the biological integrity of the Mad River corridor. The biological monitor shall ensure that a daily log and full record of project activities, including potential non-compliance whether verified or not, and the subsequent resolution or remedial action and results, is maintained, reported, and timely provided to the Executive Director and other state and federal agencies with regulatory authority over the subject project. The biological monitor shall submit the monitoring logs to the Executive Director and to other state and federal agencies requesting the logs on a weekly basis (fisheries biological monitoring logs have separate submittal requirements). The Caltrans site supervisor designated pursuant to Special Condition No. 6 shall make the required notification of non-compliance within 24 hours if the biological monitor is not available, but shall not prevent the biological (or fisheries) monitor(s) from making direct reports to the Executive Director and to other state and federal agencies.

B. Nothing in these requirements shall relieve the site supervisor designated pursuant to Special Condition No. 6 or the contractors and other non-Caltrans personnel on site, from additionally monitoring project activities for compliance with the pertinent requirements of all applicable state and federal authorizations or approvals.

CONDITION 12. SITE INSPECTIONS.

Coastal commission staff, and other agency staff that the Coastal Commission staff may coordinate site visits with, shall be authorized to enter the site at any time to observe project activities without prior notice. Caltrans shall ensure that adequate protective gear that Caltrans deems necessary for visitors is maintained at the site or elsewhere where it could be obtained without significant delay for such purposes. If activities are underway that could cause a hazard to site visitors, the Caltrans site supervisor or designee shall require that these activities be temporarily suspended as soon as practicable, for a reasonable amount of time to allow safe site inspection by Commission and agency staff, and the Caltrans site supervisor or designee shall accompany staff during such site visits. Commission staff shall notify the Caltrans resident engineer or site supervisor upon arrival.

CONDITION 13. PROTECTION OF FUTURE PUBLIC ACCESS.

A. Continued public access for pedestrians and informal bicycle use, across the new 8-foot-wide, Americans With Disabilities Act-compliant corridor on the eastward-most side of the northbound Mad River Bridge across Route 101, and continued commuter bicycle access to the 10-foot-wide paved shoulders adjacent to the traffic lanes on each bridge and off-ramp within the subject project area shall be provided and permanently protected. No signage shall be installed within the bounds of the project approved pursuant to CDP 1-07-013 that would restrict pedestrians or bicyclists from these amenities. Any proposed change to these access amenities for pedestrians and/or bicyclists shall require an amendment to CDP 1-07-013 and such amendment shall not be accepted for processing unless accompanied by a proposal to provide equivalent or superior access alternatives, including ADA-compliant facilities for pedestrian and bicycle crossings of the Mad River on Route 101.

B. Prior to issuance of this CDP, an authorized representative of Caltrans shall submit written documentation, evidencing Caltrans' agreement to be bound by the requirements of subsection A.

CONDITION 14. REVISED FINAL PLANS and FUTURE AMENDMENTS.

A. PRIOR TO ISSUANCE OF CDP 1-07-013, Caltrans shall submit evidence to the satisfaction of the Executive Director that the following changes, clarifications or confirmation of the proposed project have been incorporated into the proposed project:

- 8-foot-high "picket" outer rail originally proposed for outermost side of multi-modal corridor has been reduced to a height of 54 inches, the concrete k-rail barrier proposed to separate the corridor from the traffic shoulder has been replaced with ST-10 rail (33-inch height), the westward outer rail on the southbound bridge that was proposed as ST-20 rail is replaced with ST-10 rail topped by a bike rail of the lowest height possible consistent with bicyclist safety (which is presently proposed as 48 inches in height) and that the inside bridge rail of each bridge will be ST-10 without a bike rail (33-inch height) .
- The architectural lighting of the bridge shown on the original plans and designs has been deleted and all lighting and signage on the bridge will be the minimum necessary consistent with safety requirements and will be designed and directed to limit illumination of the habitat of the Mad River corridor below or adjacent to the structures authorized by CDP 1-07-013 to the maximum extent feasible.
- No vegetation will be removed from the Mad River corridor and no river crossing will be installed during the summer of 2008. Project activities within the river corridor during 2008 will be limited to performing fisheries and habitat baseline

surveys pursuant to plans approved by the Executive Director (Special Condition 5).

- Removal of lead contaminated soils in the northeast quadrant shall be completed, and the material removed and disposed as hazardous wastes as required in these special conditions, prior to any other soil disturbance within the lead-contaminated areas of the northeastern quadrant, including access improvements, staging, and other preliminary project activities if these activities would traverse the lead-contaminated site locations. Lead-contaminated soils identified as hazardous in Caltrans studies shall not be mixed or stored with any other materials or mingled with less contaminated or uncontaminated materials to achieve dilution of the lead contamination.
- Plans shall be revised to require that pile-driving that may affect the fisheries of the Mad River due to the production of a hydroacoustic impact footprint within the waters of the river shall be limited to the driving of a maximum of two pile sections per day to minimize the hazard to fish and to minimize the necessary extent of the Fish Exclusion Zone and its impacts on fisheries habitat of the Mad River.

B. PRIOR to COMMENCEMENT OF CONSTRUCTION other than the commencement of construction associated with the pile load test scheduled by Caltrans in 2008 for the Pier 2 location on agricultural lands southwest of the proposed bridges, Caltrans shall submit for the review and approval of the Executive Director two copies of final revised to-scale project plans, including two copies of reduced plans, with the final approval of the engineering geologist and design engineer pursuant to (A) above. The plans shall show the final proposal for ADA-compliant pedestrian features, landings, guard rails, signs, and lighting and signage. All other items set forth in Subparagraph A above shall either be clearly marked and labeled as changes with associated revised plan dates on the applicable plan sheets, or shall be called out in documents that will be dated and affixed to the final approved plan sheets (and made available with the bidding documents, etc.).

C. Amendment. Caltrans shall undertake all development in accordance with the approved final plans and with all terms and conditions of CDP 1-07-013. Any proposed changes to the approved final plans or the terms and conditions of CDP 1-07-013 shall be reported to the Executive Director. No changes to the approved final plans shall occur without a Commission amendment to this coastal development permit unless the Executive Director determines that no amendment is legally required.

CONDITION 15. REVISED WETLAND/STREAM CHANNEL MITIGATION PLAN.

PRIOR TO ISSUANCE OF CDP 1-07-013, Caltrans shall submit a revised plan for the review and approval of the Executive Director for wetland mitigation including wetland riparian loss and stream channel impacts from project activities other than pile-driving and the associated fish exclusion activities and that includes, but is not limited to, the following requirements:

A. On-site mitigation credited in previous mitigation plans submitted by Caltrans for wetland mitigation in areas that will be beneath the proposed new bridges shall be limited (or verified as limited) only to the equivalent wetland area that was delineated beneath the existing bridges slated for demolition. Other revegetation installed beneath the additional area of the proposed new bridges shall not count toward on-site mitigation, but must instead be added to the overall area of wetland mitigation that must be undertaken off-site.

B. Off-site riparian wetland mitigation at the proposed Old Samoa Road 40-acre parcel acquired by Caltrans in 2007 providing a maximum of two (2) acres of compensatory riparian wetland mitigation necessary for the Mad River Bridges project.

C. The plan shall provide that all wetland impacts associated with the proposed project construction, including any impacts to riparian corridor wetland soils or vegetation that last longer than twelve months, shall be mitigated at a minimum total ratio of 4:1, with 1:1 mitigation of riparian wetland impacts on site to the maximum extent feasible where suitable locations on the subject site exist, and the balance of the required mitigation shall require compensatory off-site mitigation within the watershed of the Mad River. (4:1 ratio means that 4 acres of similar wetland mitigation per acre of wetland impact at the project site). The plan shall further provide for the off-site mitigation of stream channel bottom impacts to channel habitat location in the area between bottom-of-bank to bottom-of-bank, and at a minimum ratio of 1:1 (1 acre of stream channel mitigation per acre of stream channel impact). The channel impacts shall be calculated annually for the authorized project activities undertaken in this area of the subject site between May 1 and October 14 annually, and added cumulatively for the final total of such area that requires 1:1 mitigation. To the extent feasible, the mitigation provided in the plan shall be performed in the location of fisheries mitigation, such as, but not limited to, the stream channel locations of fish passage improvements that may be proposed pursuant to Special Condition 5, so that the maximum ecological benefits may be obtained where feasible.

D. Final Plan

Not later than October 1 of the second pile-driving year (presently estimated as October 1, 2011 by Caltrans) Caltrans shall submit a final Wetland and Stream Channel Mitigation Plan for the review and approval of the Executive Director, in consultation

with the California Department of Fish & Game and the National Marine Fisheries Service that incorporates all of the requirements of subsections A, B, and C above and any additional mitigation for impacts to wetlands or stream channel that become necessary as the impacts of actual construction become known during implementation of the project.

CONDITION 16. CULTURAL REMAINS.

A Caltrans archaeologist shall observe all excavation activities at the subject site in consultation with the Resident Engineer, based on Caltrans' understanding of the potential proximity of the remains of a Native American village site. If cultural remains are discovered, excavation or other ground disturbance shall cease and shall not recommence until an amendment of CDP 1-07-013 supported by a cultural preservation plan prepared by a qualified archaeologist is approved by the Commission.

CONDITION 17. ASSUMPTION OF RISK.

By acceptance of Commission approval of CDP 1-07-013, Caltrans acknowledges and agrees: (i) that the site of the proposed Mad River Bridge project including relocated elements of Route 101 to the point of conformity with the existing highway, and the proposed new pedestrian landings on the north and south ends of the pedestrian corridor on the eastward side of the northbound bridge, 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.

CONDITION 18. FUTURE DEBRIS EXPOSURE DUE TO RIVER SCOUR OR EROSION.

A. If any portion of the Rock Slope Protection placed along approximately 150 linear feet of the Mad River Corridor on the bank northeast of the existing northbound bridge erodes substantially or causes substantial erosion or end effects within the Mad River channel or banks, as determined by the Executive Director, Caltrans shall submit a

complete application to remove the Rock Slope Protection and to restore the river banks to a natural condition, including native plantings and mitigation of habitat impacts that would result from the disturbance necessary to remove the rock placed pursuant to previously approved Coastal Development Permit 1-99-076. Prior to completion of the project, Caltrans shall survey the existing RSP and provide a to-scale current site plan showing "as-built" location of the subject RSP not later than January 15, 2009, and to re-survey the subject location every three (3) years thereafter and submit the results to the Executive Director.

B. Prior to issuance of CDP, an authorized representative of Caltrans shall submit written documentation, evidencing Caltrans' agreement to be bound by the requirements of subsection A.

CONDITION 19. AGRICULTURAL MITIGATION.

A. PRIOR TO ISSUANCE OF COASTAL DEVELOPMENT PERMIT CDP 1-07-013, an authorized representative of Caltrans shall submit written documentation evidencing Caltrans' agreement to be bound by the requirements of Subsection B.

B. PRIOR TO COMMENCEMENT OF CONSTRUCTION OF ANY DEVELOPMENT AUTHORIZED BY CDP 1-07-013, but only after the Executive Director has indicated that the Commission has entered into an agreement (the "Agreement") with the College of the Redwoods Foundation, the permittee shall provide to the College of the Redwoods Foundation, through a financial instrument subject to the review and approval of the Executive Director, a non-refundable mitigation fee in the sum of \$2 million dollars (\$2,000,000) payable to the College of the Redwoods Foundation. This mitigation fee shall solely be used for agricultural purposes as an endowment for the benefit of the Shively Education Center (Shively Farm) and to fund a full-time teaching position for the purpose of agricultural education at the College of the Redwoods in accordance with the terms and Conditions of the Agreement, which, at a minimum, shall include the following provisions:

(1) The subject \$2 million agricultural mitigation fee must be deposited in a separate and independent interest bearing account created solely to manage the funds consistent with the Agreement as well as prescribe the use of the funds for administrative purposes; ;

(2) The College of the Redwoods Foundation shall provide a report to the Executive Director annually describing the financial status of the fund and all expenditures from the fund during the previous year;

(3) The fund shall be segregated into two components: a \$1.5 million component that shall be reserved, including the re-investment of interest and income from this portion of the fund, for the purpose of permanently endowing a full-time teaching position for the purpose of agricultural education programs at the College of the

Redwoods, and a \$0.5 million component that shall be reserved, including the re-investment of interest and income from this portion of the fund, for infrastructure improvements at the Shively Education Center (Shively Farm) considered essential to enhancing the agricultural education function of Shively Education Center (Shively Farm) and for the purchase of up to two (2) "green" (hybrid, clean air, high mileage) vans for the transportation of students attending the College of the Redwoods agricultural education program to and from classes and activities at the Shively Education Center (Shively Farm);

(4) The teaching position shall be filled by a candidate, as shall future candidates, with a combination of education, teaching experience, and field experience that provides an excellent foundation for guiding the agricultural education program focused on the use of and support of the Shively Education Center (Shively Farm) as an agricultural teaching facility, including community agricultural outreach and education programs to enhance the skills and success of local agriculturalists;

(5) The agricultural teaching program shall be conducted in a manner that prioritizes revitalizing and sustaining the Shively Education Center (Shively Farm) and increases the farm's relevance and benefits to the County as a source of agricultural education for students, agriculturalists, community supported agricultural programs, farmers' markets, schools, and residents/gardeners;

(6) Fuel expenses and vehicle maintenance shall be funded by the College of the Redwoods from other funding sources; and.

(7) The Agreement shall include provisions to address any failure by the College of the Redwoods Foundation to implement the Agreement, including but not limited transfer of the funds to an alternate entity able to implement the Agreement, or, if approved by an amendment to this coastal development permit, to apply the nonrefundable funds to alternative agricultural mitigation.

CONDITION 20. Marine Mammal Monitoring Plan

A. PRIOR TO ISSUANCE OF CDP 1-07-013 a revised Marine Mammal Monitoring Plan, shall be submitted for the review and approval of the Executive Director in consultation with the lead project biologist for the National Marine Fisheries Service. The revised plan shall be consistent with the Marine Mammal Monitoring Plan prepared by Caltrans November 2007 except that it shall be revised to include comments submitted to Caltrans by NMFS as well as the following changes:

(1) A Marine Mammal protective zone established beyond the 160 dB peak hydroacoustic impact footprint for marine mammals shall be determined by a qualified biological acoustician and marked on a map prepared to the same scale used to designate the Fisheries Exclusion Zone boundaries required by other applicable special

conditions set forth herein. The setback distance so established up and down-river from the pile-driving operations shall be considered the boundaries of the marine mammal "hazard zone" in lieu of the presently proposed 500-foot zone up and downstream from the pile-driving locations. The biological monitor shall ensure that no marine mammals are located within this hazard zone prior to commencement of pile-driving and after any interruption of pile-driving that lasts more than one-half hour in any day, before pile-driving may recommence.

(2) If marine mammals enter the designated marine mammal hazard zone after pile-driving commences, the mammals shall be monitored until they leave the area, but shall not be disturbed or otherwise induced to leave unless Caltrans receives specific permission from a biologist of the National Marine Fisheries Service for such activities. If marine mammals enter the hazard zone during pile-driving that has not been interrupted for more than one-half hour, pile-driving may continue in accordance with the provisions of the approved plan, including use of "dry starts" to provide acoustic warning signals. The biological monitor shall make every feasible attempt to continuously monitor the mammal and to record any behavioral information observed while the mammal remains within the subject zone.

(3) During all pile-driving activities that may transmit sound or other impacts to the waters of the Mad River, Caltrans shall provide a biological monitor (other than the fisheries biological monitor(s)) qualified to monitor the presence and behavior of marine mammals.

(4) The revised plan shall show the locations of all haul-out locations within the Mad River Estuary on the map required pursuant to A (1) of this special condition, above, and shall verify that these haul-out zones are located outside of (further from) the limits of the marine mammal hazard zone identified in accordance with these provisions. If there are haul out areas located within the designated hazard zone, Caltrans shall seek an amendment of CDP 1-07-013 to provide additional protections for marine mammals or to revise the project in a manner that will reduce the hazard zone sufficiently to avoid the haul out areas, and Caltrans shall provide evidence that this information and proposal has been reviewed and approved by a biologist from the National Marine Fisheries Service.

(5) The revised plan shall correct the distance of the proposed project site from the mouth of the Mad River – which is stated in the plan as approximately four (4) miles distant, but is less than two (2) miles distant according to project records submitted by Caltrans.

B. All project activities shall be undertaken in accordance with the final plan approved by the Executive Director in consultation with the National Marine Fisheries Service. Any proposed changes to the final approved plan shall require an amendment of CDP 1-07-013 unless the Executive Director determines that no amendment is legally required.

CONDITION 20. Marine Mammal Monitoring Plan

A. PRIOR TO ISSUANCE OF CDP 1-07-013 a revised Marine Mammal Monitoring Plan, shall be submitted for the review and approval of the Executive Director in consultation with the lead project biologist for the National Marine Fisheries Service. The revised plan shall be consistent with the Marine Mammal Monitoring Plan prepared by Caltrans November 2007 except that it shall be revised to include comments submitted to Caltrans by NMFS as well as the following changes:

(1) A Marine Mammal protective zone established beyond the 160 dB peak hydroacoustic impact footprint for marine mammals shall be determined by a qualified biological acoustician and marked on a map prepared to the same scale used to designate the Fisheries Exclusion Zone boundaries required by other applicable special conditions set forth herein. The setback distance so established up and down-river from the pile-driving operations shall be considered the boundaries of the marine mammal "hazard zone" in lieu of the presently proposed 500-foot zone up and downstream from the pile-driving locations. The biological monitor shall ensure that no marine mammals are located within this hazard zone prior to commencement of pile-driving and after any interruption of pile-driving that lasts more than one-half hour in any day, before pile-driving may recommence.

(2) If marine mammals enter the designated marine mammal hazard zone after pile-driving commences, the mammals shall be monitored until they leave the area, but shall not be disturbed or otherwise induced to leave unless Caltrans receives specific permission from a biologist of the National Marine Fisheries Service for such activities. If marine mammals enter the hazard zone during pile-driving that has not been interrupted for more than one-half hour, pile-driving may continue in accordance with the provisions of the approved plan, including use of "dry starts" to provide acoustic warning signals. The biological monitor shall make every feasible attempt to continuously monitor the mammal and to record any behavioral information observed while the mammal remains within the subject zone.

(3) During all pile-driving activities that may transmit sound or other impacts to the waters of the Mad River, Caltrans shall provide a biological monitor (other than the fisheries biological monitor(s)) qualified to monitor the presence and behavior of marine mammals.

(4) The revised plan shall show the locations of all haul-out locations within the Mad River Estuary on the map required pursuant to A (1) of this special condition, above, and shall verify that these haul-out zones are located outside of (further from) the limits of the marine mammal hazard zone identified in accordance with these provisions. If there are haul out areas located within the designated hazard zone, Caltrans shall seek an amendment of CDP 1-07-013 to provide additional protections for marine mammals or to revise the project in a manner that will reduce the hazard zone sufficiently to avoid the haul out areas, and Caltrans shall provide evidence that this information and

proposal has been reviewed and approved by a biologist from the National Marine Fisheries Service.

(5) The revised plan shall correct the distance of the proposed project site from the mouth of the Mad River – which is stated in the plan as approximately four (4) miles distant, but is less than two (2) miles distant according to project records submitted by Caltrans.

B. All project activities shall be undertaken in accordance with the final plan approved by the Executive Director in consultation with the National Marine Fisheries Service. Any proposed changes to the final approved plan shall require an amendment of CDP 1-07-013 unless the Executive Director determines that no amendment is legally required.

4.0 FINDINGS AND DECLARATIONS

The Commission finds and declares as follows:

4.1 PROJECT PURPOSE

4.1.1 Primary Project Purpose

Public Safety Project

Caltrans states that the project is proposed “for public safety purposes” and proposes to replace the aging pair of rural Highway 101 bridges crossing the Mad River north of Arcata and south of McKinleyville, in Humboldt County. Caltrans has determined that both bridges are “structurally deficient” and “at the end of their useful life.” Caltrans states that for reasons discussed below, if the bridges are not replaced as proposed, the bridges will eventually fail. The main source of the background information for the subject project is the “Mitigated Negative Declaration and Initial Study” published by Caltrans in June 2005 and certified by Charles C. Fielder, Director, District 1, on June 17, 2005 based on the Determination that “the proposed project would not have a significant effect on the environment...” executed by Lena Ashley, Chief, North Region Environmental Services, Department of Transportation, on June 17, 2005.

Caltrans has provided the following additional information deemed accurate as of December 17, 2007:

The existing southbound bridge is 742 feet long with a surface area of 24,650 sq. ft. The proposed “ ” would be 752 feet long, “ ” of 37,460 sq. ft. The proposed southbound bridge varies from 42.3 feet in width at its south end, to 57.5 feet at its north end.

The existing northbound bridge is 742 feet long with a surface area of 25,835 sq. ft. The proposed " " is 752 feet long with a " " of 45,856 sq. ft. The proposed northbound bridge varies from 51.2 feet in width at its south end to 86.8 feet at its north end.

At the widest combined point, including a small gap between the bridges, the overall width measured from outside deck to outside deck of each bridge will be about 152 feet in width at the northern end. By comparison, Caltrans estimates that the existing bridges have a combined width (at the widest part) of about 90 feet.

Thus, the proposed new bridges will have approximately 32,831 square feet of additional surface area, compared with the existing bridges.

US Route 101/Mad River Bridges "Lifeline"

The bridges crossing U.S. Highway 101 at the Mad River are particularly important because the river is relatively wide (an average of 200 feet in width at channel bottom, bank to bank) and carries substantial water year-round (even during the summer, flowing water may be as much as ten feet deep in some parts of the channel).

During high water flows, the river cannot be crossed safely on foot. If the bridges fail for any reason, crossing the Mad River would be difficult, and at times impossible, by any means, and emergency service vehicles could not extend support beyond the river's boundaries until adequate repair or replacement of the bridges. The nearest hospital north of the McKinleyville side of the Mad River is over an hour's drive north, in Crescent City. Thus, the crossing of the Mad River north of Arcata and south of McKinleyville provides a vital transportation "lifeline" on the north coast.

The Mad River crossing links families that live in the communities between Orrick (to the north) and greater Fortuna (to the south), including Trinidad, McKinleyville, Arcata, Eureka, and all of the smaller communities in between – and beyond. Many people commute from one side of the bridges to the other, daily, not only for work, but for access to schools, medical support, and shopping. It is not unusual for McKinleyville area residents to cross the Mad River daily: Unincorporated McKinleyville has experienced significant growth during the past fifteen years, and many McKinleyville residents work in Arcata or Eureka, or have students in schools in these locations. If the Mad River bridges failed, family members could be stranded on one side or the other of the Mad River – possibly for days if a disaster such as a significant earthquake rendered the bridges unsafe to cross by vehicle. The Mad River Bridges and the Eureka Slough Bridges are the two most immediately vital water crossings on Highway 101 in the central part of Humboldt County.

The Mad River crossing is also an essential regional link in the transportation routes that provide public coastal access to the north coast beaches, trails, and lagoons, and to the coastal recreation activities and visitor-serving commercial uses associated with the spectacular coastal resources of northern Humboldt and Del Norte counties. A safe

crossing of the Mad River connects local, regional, state, national, and even international visitors to the coastal access and recreation amenities of hundreds of miles of northern California coastline, including some of the most beautiful beaches, trails, lagoons, and bluff-top views in the world.

Finally, the Mad River crossing is an important part of the primary state and interstate coastal commerce corridor – a critical link in the United States Highway System, thus “U.S. Route 101.” Without a significant ocean-shipping port or railroad presently in place on the northern California coast, there is presently no other way to transport people or goods within or beyond the region (other than pedestrian, bicycle or air travel) other than U.S. Route 101.

Scour Activity Remediation

Caltrans' 1993 Bridge Inspection Reports and reports prepared by Caltrans since that time indicate that both bridge foundations are “unstable for calculated scour conditions” and that the north and southbound structures have been listed in the Structure Replacement and Improvement Needs Report since 1991, and Caltrans has been targeting bridge replacement by 1994/1995. Caltrans considers the proposed bridge replacements to be at least thirteen years overdue, and necessary to address past scour of the river channel that has undermined the existing bridge foundations. The Negative Declaration (June 2005) stated that (quotations from Caltrans sources are shown throughout this report in Times New Roman font):

“...The riverbed beneath the northbound bridge has been reduced in elevation by ..15 ft. since construction in 1929 and by 6 ft. since 1958 for the southbound bridge. Gravel extraction operations have occurred upstream of the bridges over the last 40 years. Impacts resulting from the removal of riverbed materials may have contributed to the rate of scour over time. Bridge pier size and location and natural river hydrodynamics may also contribute to scouring. As a result, bridge pier foundations are being exposed. Undermining the pier foundations can lead to unstable bridge conditions with possible collapsing of the structures.”

Commission staff pointed out to Caltrans that the County of Humboldt Extraction Review Team (CHERT) process has provided oversight of the gravel extraction operations in the rivers of Humboldt County during the past ten years, and that the result of this oversight has been the reversal of chronic over-extraction that produced scour patterns that affected the bridge, and other reaches of the Mad River in the past. Caltrans responded that:¹

¹ Provided in an undated & unsigned attachment entitled “Caltrans District 1 response to California Coastal Commission Staff Request for More Information on Mad River Bridges – Constructability/Alternatives Analysis” to an e-mail message sent by Gary Berrigan, Caltrans, to Commission staff, dated November 6, 2007

"...The design of the new Mad River Bridges is controlled by local pier scour induced by the 100-year flood, not by degradation induced by upstream mining operations. In 2004, as part of their biennial inspection of the Mad River Bridge and after investigating and inspecting the bridge while taking measurements of the channel, Caltrans Structure Maintenance and Investigations engineers prepared their latest channel cross-section of the Mad River at the bridge crossing location. The cross sections, which Caltrans has been preparing since 1957, indicate that local bridge scour is still occurring due to the characteristics of the river and the underlying geology at the crossing location regardless of gravel extraction."

"The bridge inspection report (the document used to scope and program the replacement project) rated the existing Mad River Bridges as a "3" on a scour scale from 9 to 0. "9" is a bridge on dry land and "0" is a bridge that has collapsed from scour. As defined by Caltrans using Federal Highway Administration (FHWA) criteria, a "3" is described as "bridge is scour critical; bridge foundations determined to be unstable for assessed or calculated scour conditions:

- Scour within limits of footing or piles
- Scour below spread-footing base or pile tips"

"Following FHWA methods for calculating future anticipated scour at bridges, which is controlled by the anticipated 100-year flood, the local pier scour elevation was determined to occur in the order of 15 feet below the thalweg (low spot) of the river. The local pier scour elevation defines the elevation as to what depth scour can be anticipated to occur from the 100-year flood. If a pile cap were used, as would be required with the use of 30-inch diameter piles, additional excavation of material would be required within the cofferdam to construct the pile cap below the scour elevation. Approximately 47 feet of excavation would be required at Pier 2, approximately 36 feet at Pier 3 and approximately 41 feet at Pier 4 since the original ground where each of the piers is to be constructed is at a higher elevation than the low spot of the river. The depths of excavation take into account the thickness of the footing and seal course (see below for a more detailed explanation), which are placed below the scour elevation line. With a 7-foot diameter pile alternative, approximately 30 feet of excavation at Pier 2, 10 feet at Pier 3 and 20 feet at Pier 4 will still occur below original ground but only to a depth to what is termed the pile cut-off elevation. The bridge design engineer through detailed analysis establishes the pile cut-off elevation. The pile cut-off elevation establishes the location where the support shaft transitions from a pile to a pier with this monolithic piling to pier design. Also, since a footing is not required with the 7-foot diameter pile option, the cofferdam size will be much smaller resulting in less volume of excavation."

Seismic Improvements

The Negative Declaration (June 2005) states:

"...B. **Seismic Improvements**...Since the northbound structure was constructed in 1929 and the southbound structure constructed in 1958, neither bridge meets current seismic design

guidelines even though the southbound bridge was seismically retrofitted in 1987. However, no retrofitting of the northbound bridge has ever occurred. The proposed bridges will be designed to withstand the maximum credible seismic event for the project location and will be designed to meet current seismic design guidelines.”

The Negative Declaration contains several erroneous statements in the section on geology/seismic hazards, which Commission staff requested that Caltrans staff address.² Caltrans’ engineering geologist and others provided two responses to Commission staff on December 18, 2007, included in the geology/hazards section below.

4.1.2 SECONDARY PROJECT PURPOSE

Operational Hazards

Caltrans has provided accident statistics from the “Traffic Accident Surveillance and Analysis System” compiled for the five (5) years from April 1, 1997 through March 21, 2002. The data shows the actual collision rates for each highway segment and statewide average collision rates for similar type facilities. Caltrans determined on the basis of this information that the collision rates on the Mad River Bridges are 2.36 times higher than the state average for a similar facility. Caltrans further determined that the collision rates on Route 200 (also known locally as “North Bank Road”) near the project area are 3.03 times higher than the state average. Caltrans further determined that of 42 collisions reported during the subject five-year period, about two-thirds of the collisions were caused by vehicles weaving from one lane to another to access the Central Avenue on- and off-ramps (main access to McKinleyville from U.S. 101 in this location), and about one-third of the collisions occurred in the Central Avenue off-ramp/Route 200 intersection area. Caltrans states that the majority of these broadside collisions resulted from unsafe driving practices using the off-ramp and westbound Route 200 traffic failing to yield to U.S. Route 101 traffic. Caltrans also identified poor sight distance as a contributing factor.

Improved Operational Safety

The Negative Declaration (June 2005) states that:

“...the bridges are structurally deficient...and do not meet....geometric (e.g. road curve, lane width, vertical clearance) guidelines. The proposed project is designed to correct these deficiencies...”

Caltrans has explained that when work is undertaken on a section of road or highway, that section is upgraded to meet current safety guidelines, even if the changes are

² Telephone conference of North Coast District Manager Robert Merrill with Caltrans staff, including engineering geologist and others, December 11, 2007 and follow-up email sent to Caltrans by Robert Merrill on December 11, 2007.

beyond the primary purpose and need of the proposed project. For this reason, Caltrans has expanded the scope of the proposed project to include a new configuration of the on- and off- ramps. The new design requires that the northbound off-ramps that presently takeoff north of the bridge be incorporated into the new northbound bridge, adding significantly to the width of the portion of over-water footprint of that structure. In addition, the existing shoulders will be widened to ten feet on the outer shoulders and five feet on the inner shoulders of each bridge – adding approximately 20 feet of total width (more if the off-ramp is included), to the new bridges.

4.2 PROJECT DESCRIPTION

4.2.1 Background

While the primary purpose of the proposed project may be expressed simply as the replacement of an aging pair of highway bridges, the scope of the proposed project includes substantially more than this. The new bridges will be wider than the existing bridges, as will the off bridge new highway elements to the point of conformity with the existing highway features. New on and off-ramps will be constructed, and ST-10 guard rail topped by a bicycle rail will be included in the new bridge designs. A new multi-modal corridor primarily for pedestrians will be provided on the eastward side of the proposed northbound bridge. As many as ten culverts will be installed or replaced, and substantial hydrologic changes will occur in the area surrounding the proposed project footprint after construction is completed.

Caltrans has also revised and expanded the project description since publishing the Mitigated Negative Declaration certified by Caltrans in June 2005 – primarily in response to new information about the project's potentially significant adverse impacts on listed salmonids. Many components of the revised project have not yet been fully described (particularly aspects of the project related to the construction and management of fish exclusion devices, fish management structures, and fisheries/environmentally sensitive habitat mitigation) and some essential baseline studies of riverine habitat and fish populations have not been completed. This information will be provided through compliance with the pertinent Special Conditions set forth herein (See Special Conditions 2, 3, 4, 5, 15, and 20 in particular).

In addition, project cost estimates have increased significantly since publication of the estimates in the June 2005 Negative Declaration (project costs at \$35 million for construction and \$600,000 for right-of-way). Project costs have risen to \$50 million for construction, and \$2 million for right-of-way as of December 2007.³

³ Personal communication of Richard Mullen, project manager, by e-mail December 13, 2007.

4.2.2 Environmental Context of the Proposed Project

Prime Agricultural Lands

As the aerial photograph of the proposed project site shows, below, the rural setting of the subject site is marked by broad expanses of farmed coastal terrace lands. The topography is broken by the ascent into the marine terraces that mark the southerly end of outer McKinleyville, to the northeast.

The lands in the area of the project site tend to be large, relatively flat parcels with prime soils, dedicated to livestock grazing and forage production. A goat farm and dairy with a historic Victorian farmhouse is located immediately east of the project site. Most of these lands are zoned Agriculture Exclusive, with 60-acre minimum parcel sizes. Planning documents prepared by Humboldt County for the pending General Plan update identify the lands in the Mad River floodplain and environs as being among the most productive agricultural lands in the County.

The proposed project would permanently convert 3.58 acres of prime agricultural lands to highway use. An additional area of approximately ten (10) acres of prime agricultural lands would be temporarily impacted over the approximately five (5) years of construction in various locations. Caltrans further proposes to convert up to approximately ten (10) acres (total) acres of non-prime grazed wetland pasturelands to riparian wetland habitat for mitigation of the loss of riparian vegetation at the Mad River project site that cannot be achieved on site. The off-site mitigation location is a forty-acre grazed wetland pasture located along Old Samoa Road, south of Arcata (see Exhibits BB, CC), purchased by Caltrans in 2007.



Figure 1. The Mad River Bridges, U.S. Route 101, unincorporated Humboldt County. Source: Google Earth.

Scenic corridor, community character

U.S. Route 101 in Humboldt County is eligible for Scenic Highways designation (such designation must be proposed by Humboldt County, but the County has not pursued Scenic Highways status). The highway corridor within the project bounds offers expansive views toward the coast, up the river corridors, and across the wide swath of pasture bottomlands west of the site. The vista from the bridges is of pasturelands dotted with older farmhouses and barns – the iconic rural landscape idealized in

Humboldt County. Caltrans indicates, however, that the most of the seven late-nineteenth-century gabled-farm houses and mid-twentieth century homes near the project site fail to meet the technical requirements for inclusion in the National Register of Historic Places because the structures:

“...lack association with significant historic events or persons, architectural quality or rarity, or integrity.”

However, many of these structures nevertheless mark the rural, historic feeling of the pastoral scenes of Humboldt County in recognizable, enduring ways and the gabled farm house associated with the dairy east of the bridges is a local landmark. Caltrans proposes to demolish and remove an existing older farm house that was previously moved to the property, southwest of the proposed new bridges. Caltrans has verified, as noted above, that the farm house does not have particular historical significance.

Landscape setting, Mad River riparian corridor, visual resources

The banks of the Mad River on both sides of the proposed project contain mature willows, alder, cottonwoods and water birch. Many of these trees are of specimen size and have fully developed understory vegetation. The overhang of the riparian canopy provides shade and important fish habitat along the river. The project would require substantial grading of the river banks on the west side of the existing bridges, both north and south of the river, and significant vegetation removal on the east side of the river crossing.

A stand of fourteen mature Monterey pine trees will be removed adjacent to the southbound Central Avenue on-ramp. Caltrans originally planted these trees as landscape elements and proposes to replace the trees with a native species such as Bishop Pine (*Pinus muricata*). Caltrans landscape architects have verified that this species will mature to the same mass as the existing Monterey pines.

The loss of the mature trees would have an adverse visual impact during the time required for growth of new plantings to full maturity. The alignment of the new bridges on the west side of the existing bridges will, however, result in the permanent removal of the large billboard on that side of the highway, which will be a significant visual benefit. The billboard slated for removal is located on the northwest bank of the Mad River immediately south of the southbound onramp. County planning staff verified upon the request of Commission staff that the billboard could not be legally relocated or replaced elsewhere on the parcel, because billboards are not a permitted use on the agriculturally-zoned lands. Caltrans has also confirmed that it has purchased the full development rights to the billboard as part of the right-of-way issue resolution. Thus, the removal of the billboard will be a permanent benefit to visual resources and will therefore help to off-set the visual impacts caused by removal of the Monterey pine trees in the northwest quadrant of the proposed project.

The proposed new bridges will be substantially wider than the existing bridges, however the new bridges will be of similar designs and will be constructed at the same finished deck elevations, which will improve river views for drivers. Caltrans has additionally agreed to revise the proposed project to delete architectural lighting on the bridge (and thereby limit lighting to the minimum safety signage necessary by law) and to reduce the height of the outermost rail on the northbound bridge (that rail on the outer edge of the proposed multi-modal corridor would have been eight feet in height and would have interfered substantially with public views of the river corridor) and to replace the proposed plain k-rail barrier between the multi-modal corridor and the adjacent 10-ft.-wide highway shoulder with a see through barrier rail matching the proposed ST-10 rail that will be used elsewhere on the proposed new bridges.

Sensitive species and habitat

Caltrans currently proposes to permanently impact approximately four (4) acres of total wetlands in various categories, which Caltrans proposes to mitigate at approximately a 1:1 ratio on site and an approximately 3:1 ratio off site for a total ratio of 4:1 (four acres of mitigation per acre of impact) and to temporarily impact eight to ten (8 to 10) acres stream channel wetlands due to annual construction and access disturbance within the stream corridor over the course of four (4) to five (5) years of such activities. No mitigation is proposed for the impacts within the river channel.

Mature riparian vegetation on the river banks west of the bridges includes willows, alder and birch, including some specimen trees and thick undergrowth. The waters of the Mad River in the vicinity of the project provide critical habitat for rare or endangered fish species, including 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. The biologists of the National Marine Fisheries Service and the California Department of Fish and Game indicate that the portion of the Mad River that will be affected by the proposed project contains some of the richest fish habitat for listed salmonids within the Mad River watershed.

Adult salmonids are known to rest and seek refuge in a permanent deep scour pool that has formed at the southbound bridge pier within the river channel. Caltrans proposes to construct a replacement scour pool on the west side of the new bridge, about 100 feet downstream, after pile-driving that could affect fish is completed (if the scour feature is constructed earlier, as previously contemplated by Caltrans, it could become an attraction to fish within the hydroacoustic impact hazard footprint generated by pile-driving), and before September 15 of the pertinent year, as advised by the National Marine Fisheries Service. The new scour pool will not remain permanently, in comparison to the scour pool that will be lost to bridge demolition. Most scour pools that are not supported by a permanent feature within the river flow (such as the bridge pier) are filled in or altered by the forces of high water flows and typically disappear within a few years.

Caltrans biologists have also noted that the Mad River riparian corridor serves as a wildlife migration corridor out to the Mad River Dunes, and that the corridor may be of particular importance to mountain lions, a California mammal of special significance. The continued availability of the corridor during the anticipated five (5) years of project construction is important to the maintenance of the species in this area, according to the Caltrans project biologist.⁴ Caltrans staff clarified on request that:⁵

“...there are no plans for night work in the river corridor. The scheduled night work is for roadway work. During certain phases of construction Central Avenue will be closed and traffic will be re-routed to School Road. During this time, work will be at night and focus on the southbound 101 on ramp from Central Avenue. There will also need to be night work at the Route 200 (North Bank Road) intersection for similar reasons. Both locations are out of the river corridor. There also may be night work at the south end of the project in preparation for shifting traffic to the new alignments.”

No federal- and state-endangered plant species have been identified in the project area, according to the Negative Declaration.

Migratory bird nesting on bridges

The Negative Declaration noted that some migratory bird nesting has been detected by Caltrans on the existing bridges during several surveys. The 2005 Negative Declaration stated that nesting during the applicable years of construction and demolition activities would be prevented through the deployment of exclusionary netting under the bridge decks. Staff determined that this netting has been associated with the entrapment and death of birds attempting to access nesting sites. Caltrans has since altered the project description to require the seasonal discouragement of nesting through physical removal of attempted nests before nest completion or through the timing of demolition activities by the contractor to avoid nesting season (nesting season is considered concluded by August 31 annually or after birds in existing nests are fully fledged). Caltrans indicates that no bat roosting occurs on the bridges because the bridges do not contain openings that bats can enter.

Cultural resources

Caltrans has stated that cultural remains are not known to occur within the area of the proposed project. However, the 2005 Negative Determination states in pertinent part that:

⁴ Personal communication of Caltrans project biologist Kelley Garrett to Commission staff on December 12, 2007.

⁵ Personal communication of Caltrans lead environmental planner for the Mad River Bridges project, Gary Berrigan, in e-mail message of December 18, 2007.

"... The project area is located one mile up the Mad River which has a long history of human use associated with the river including Native American and later with European settlers beginning around 1850. The project area has been one of three areas historically used for crossing the Mad River. The project is within the ethnographic territory of the Wiyot and the general area has high potential for archaeological sites."

".... Although reference documents indicate a village site is in the vicinity, field surveys conducted October 3-4, 2002 did not result in the observation of any cultural resources within the project limits."

"... In the event that archaeological materials are encountered during construction activities, Caltrans' policy requires that work be immediately halted in the area of the find until a qualified archaeologist can evaluate it."

4.2.3 Project Elements

Caltrans has provided a series of revised project descriptions that have culminated in the following comprehensive description, which is substantially different from the description set forth in the Mitigated Negative Declaration certified by Caltrans June 17, 2005, and differs in important ways from the project description submitted by Caltrans in support of the application for CDP 1-07-013. The following elements of the proposed project description were submitted by Caltrans on December 7, 2007 and Caltrans submitted further corrections on December 13, 2007. Information set forth below that is quoted directly from the most recent project description is shown below Times New Roman font (as are other direct quotations taken from Caltrans documents within this report).

4.2.3.1 Overview of the proposed project description

"The existing northbound bridge over the Mad River was constructed in 1929. Lane widths on the existing northbound structure are 11 feet (ft) and shoulder widths are one ft. The southbound structure was constructed in 1958 as part of the Route 101 freeway construction. Lane widths on the southbound structure are 12 ft and shoulder widths are two ft respectively. Each of the new proposed structures would consist of two 12 ft lanes, a five ft inside shoulder and a 10 ft outside shoulder. The new northbound structure would also include an additional eight ft multi-purpose pathway."

"The existing north and southbound bridges (proposed to be replaced) have four piers apiece within the banks of the river (piers 6, 7, 8, and 9), covering a total area of approximately 2930 sq. ft. (per Lewis Shen, Caltrans Structures Design, 8/16/07). The new bridge structures will have two piers apiece within the river. (Previous documents were incorrect in stating that the proposed new bridges will have three piers apiece within the river.) The proposed bridge design shows Pier 2 well outside the river's top of bank, Pier 3 falls within the river's average ordinary high water (OHW) elevation, while Pier 4

appears just below the river's top of bank and is presumed within the OHW. Cumulatively, new pier piles will cover an area of 366 sq. ft. (based on 7-ft diameter pile; total of 9 piles). Replacement of the existing bridges with the proposed bridge structures is anticipated to result in a net permanent gain in river channel area of 2564 sq. ft. (0.06 acre)."

As stated above, the proposed southbound bridge varies from 42.3 feet at its south end to 57.5 feet at its north end. The northbound bridge varies from 51.2 feet at its south end to 86.8 feet at its north end. At the widest combined point, including a gap between the bridges, Caltrans estimates that the overall outside to outside deck will be about 152 feet wide at the northern end. By comparison, Caltrans estimates that the combined width of the two existing bridges totals about 90 feet in width at the widest (northern) part of the combined bridges.⁶

"The proposed project will realign Route 101 to the west of the existing structures. In addition, modifications to the southbound Central Avenue/101 onramp and to the northbound 101 off ramp where it intersects with Route 200 (North Bank Road) will be necessary. Construction of the project is expected to take four years."

4.3.3.2 Construction Summary

"Existing structures will be used for traffic handling while new structures are constructed; allowing two lanes of traffic in each direction during construction. It is anticipated that detours and/or lane closures will be required between construction stages as traffic is shifted from the existing bridges to the new bridges. Construction lead-time will be required for the procurement of steel pipe piling on this project. The timeline for steel pipe piling procurement as estimated during the General Plan Estimate is approximately six to eight months."

Caltrans indicates that it is essential to Caltrans' annual "contract with the director" - a project management/delivery schedule imposed internally within Caltrans - that the proposed project be "ready-to-list" (RTL) - that is, with all state and federal permits or authorizations approved and issued -- by March 1, 2008.

However, Caltrans also notes that it will take up to the six to eight months (or more, possibly up to a year according to other Caltrans engineers with experience in the procurement of heavy steel shell piles in the 7-foot-diameter size range) for procurement of steel piling. There will also be further review by state and federal agencies, and the in-water construction season for pile-driving activities will not commence until July 1 of 2009. Thus, the project will likely be a five-year project (possibly six years) with pile load testing at Pier 2 potentially

⁶ Personal communication of Caltrans lead planner Gary Berrigan by e-mail to Commission staff May 30, 2007.

commencing in the summer of 2008. For this reason, the "pile load test" referred to below as being performed during Construction Year 1 will actually be performed during Construction Year 1A for a total of five construction years (1A plus years 1-4) if a sixth "overrun" year does not become necessary. Pile 2, the pile load test site, is located well south of the southerly western bank of the Mad River in pasturelands and would have little, if any affect on the river habitat according to Caltrans.

Because of these limitations, it is not necessary for a temporary bridge crossing to be constructed during the summer of Year 1A and this crossing, plus the removal of riparian canopy within the river corridor during 2008, would be deleted pursuant to the requirements of Special Condition 14 (Revised Plans).

"A pile load test will be performed at the proposed Pier 2 location during Construction Year 1. The purpose of the pile load test is to verify the geotechnical capacity of the piles. The result of this test will also help in developing the pile acceptance criteria for this project. Also, a temporary bridge crossing may be utilized and would be constructed over the active river flow in accordance with the applicable permits and work windows." (See discussion above)

"Scour at the existing bridges' pier footings, have caused the formation of a backwater pool below the bridges, on the rivers' north bank. This pool is utilized as holding habitat by adult salmonids during fall migration..."

July 2007 surveys of the Mad River fisheries undertaken by Caltrans biologists indicated that adult steelhead were also observed in the subject scour pool.

...To ensure that construction activities do not alter migratory behavior, a new scour feature will be constructed....

The existing bridge pier that sustains the scour pool will be demolished and removed before the new scour pool is constructed, depending on the progress of the construction schedule, and the scour pool habitat will be rendered unavailable during the summer construction seasons, as will a large area of stream habitat that will be excluded from fish use for a substantial period each summer according to the most recent Caltrans proposal. Caltrans plans to remove the fish exclusion structures by September 1 in the years the structures are in place, reducing the potential that the fall migration of adult Chinook would be affected specifically by the exclusion features.

... To avoid impacts to salmonids, the scour feature will be constructed after all pile driving activities have been completed at piers 3 and 4. Because the scour

feature also must be constructed prior to September 15, it would not be constructed until Year 3 or Year 4. This feature is anticipated to create new holding habitat.

As discussed elsewhere in this report, however, the proposed scour feature is unlikely to last for more than a few years. Caltrans has indicated that leaving any portion of the pier footing in the river for the permanent preservation of the existing scour pool feature is not an option, however, as the structure may create a hazard within the river.

... Construction of the scour feature may cause short-term turbidity increases and other disturbance of the riverbed, bank and channel.”

“Construction – Year 1

“The new southbound Mad River Bridge will be the first bridge constructed and it is anticipated that this will take two years to complete. In the first year of construction, earthwork for the approach fills at both ends of the bridge will be constructed. These fills will conform the new roadway elevation to the new bridge elevation. These fills are above the high water elevations. The bridge abutments (beginning and end supports for the bridge) can be constructed outside of a work window, as they also are located outside of the river channel.”

“Some excavation will be necessary prior to driving or drilling abutment piles for the bridge footing. Before driving or drilling abutment piles, a cofferdam consisting of interlocking sheet piles will be constructed in the area to be excavated in order to minimize environmental impact and to provide structural stability to the excavated area. Driving or drilling of piles will commence the moment the cofferdam is excavated to the desired level. Once pile driving is completed, a concrete tremie seal will be placed to seal the bottom of the cofferdam for safe and dry access, then, the footing formwork will be set and bar reinforcing steel will be placed. The steel will require either a crane or a truck and forklift to place the steel near the footing. The concrete will either be poured by the use of a concrete pump located near the footing, or by crane and bucket or by having concrete trucks pour directly through use of a chute. Once the footing concrete has reached specified strength, the footing forms will be removed. The steel reinforced concrete abutments will be placed in the same manner that the abutment footings are placed. Once completed, the abutment and abutment footings will be back-filled.”

“Prior to work at the piers, which are below ordinary high water, cofferdams will be placed according to the methodology for de-watering as described within this report.

(See pages 8-9, In Channel Work Windows and Standard Impoundment/Channel De-watering). Bridge piling will be driven or drilled into the ground by use of a diesel, hydraulic hammer or drill rig. Other equipment that may be within the work area includes: excavators, cranes, concrete pumps and large trucks. The pier will be constructed using reinforcing steel and cast-in-place concrete. A concrete truck wash-out location will be provided on site, outside of the river channel. Once the concrete is cured to the specified strength, the base of the pier will be back-filled with native material and the cofferdam sheet piles will be removed."

"All equipment and construction material will be removed from the channel by October 14th of each year. Gravel bars disturbed by project construction will be graded to prevent fish impoundment. For piers located outside of ordinary high water, construction will be similar as to that described above, though without the use of a water diversion."

"Construction – Year 2

"Year 2 construction will focus on bridge superstructure, or deck, for the new southbound bridge. Generally, false work is built using wood or steel beams for horizontal members, wood posts or steel pipe for vertical members, wood or pre-cast concrete pads to support posts and wood joists and plywood to form the superstructure. The false work is a temporary, wooden bridge that will span the wet channel, and is used to form the bridge and hold its superstructure loads during construction."

"When the false work is completed, bar reinforcing steel, along with ducts for post tensioning steel cables will be placed, along with the additional form-work on the false work of the bridge. Next, concrete will be poured by use of concrete pumps for the bottom of the bridge (soffit), the vertical support members (stems/girders) and for the driving surface (bridge deck). The false work will then be removed and any gravel bars altered for the purposes of construction will be graded to conform to natural gravel bar structure to prevent fish impoundment."

Any earthwork that may have not been completed for the bridge approach would be completed at this time and the asphalt concrete pavement for the new bridge would be laid and compacted. Approach slabs will be formed at either end of the new bridge to provide a smooth transition between the bridge and pavement at either end of the bridge. Finally, guardrails will be installed and traffic striping will be completed.

Connection of the southbound on-ramp from Route 200 and Central Avenue will most likely require a construction time of 24 hours a day, 7 days a week. This connection will occur after the new southbound structure is complete.

Caltrans has previously stated, and has confirmed on December 18, 2007⁷ that no night construction will occur within the Mad River corridor. The corridor is a wildlife corridor and contains habitat for numerous sensitive species. In addition, Caltrans biologists have noted that mountain lions (a California mammal of special significance), and other wildlife rely on the cover of the riparian canopy, and adjacent habitat of the river corridor, to reach the Mad River Dunes.

Construction – Year 3

The third year of construction will involve removal of the existing southbound bridge as well as the construction of the new northbound bridge. A Bridge Removal Plan for removal of the existing southbound bridge will include a Debris Containment Plan for all work over the waterway, and be in accordance with all applicable permits. Construction activities for the northbound bridge are consistent with the methodologies for construction of the southbound bridge (described in Construction Years 1 and 2). Explosives will not be used to dismantle the existing bridge and no portion of the bridge will drop into the live channel. The concrete deck surface, girders and remaining superstructure will be removed in sections. All containment for concrete debris and paint removal will be in place before any removal activities occur.

Due to possible future scour concerns, and since the existing concrete footings are fairly shallow, it is proposed to completely remove the existing concrete footing, excluding the piles. At this construction stage, the river will be diverted for the proposed construction of the new northbound bridge. The demolition of the southbound bridge will occur within the confines of this existing water diversion, containing any sediment or turbidity due to the bridge removal.

“Construction – Year 4

“Remaining superstructure work for the new northbound bridge will be completed as well as the asphalt concrete paving, approach slabs, guardrail installation and traffic striping. The traffic will be moved over to the new bridge and removal of the existing northbound bridge will be performed. The removal of the old northbound bridge will be accomplished the same way as proposed for the southbound bridge (see Construction – Year 3).”

“The river will be diverted in order to remove the existing piers and footings and the debris containment system will be placed over the waterway to ensure compliance with water quality regulations during demolition. Once the northbound bridge is removed, the water diversion will be graded to conform to

⁷ Personal communication by e-mail of Gary Berrigan, Caltrans, to Commission staff dated December 18, 2007.

the natural gravel bar structure. In addition, staging areas and access roads will be removed and re-vegetated.”

4.2.3.3 Other Elements of the Proposed Project

Caltrans provided the following information regarding the proposed project activities on December 7, 2007:

“Removal of Vegetation

“Removal of trees and other riparian vegetation will be required to realign the bridges. The majority of vegetation removal will be to the west side of the existing bridge structures within the footprint of the new alignment. While access for construction will be necessary on the east side of the existing structure, access roads in these areas currently exist. All vegetation removal will take place during the period September 1 through March 1, prior to construction, to avoid impacts to migratory nesting birds.”

This is a change from the use of exclusionary netting established as a mitigation measure in the certified Negative Declaration to prevent migratory bird nesting during construction.

“Pre-construction Site Preparation Prior to March 1 of Construction Year One (1)

“In preparation for the first year’s construction activities, vegetation removal will be necessary prior to March 1, 2008, to avoid impacts to migratory nesting birds. Demolition of an existing residential structure also will be necessary prior to beginning construction. “

As stated, Caltrans has revised the construction schedule to include a pile load testing phase, or what is being referred to as “Construction Year 1A” – in part because the contractor eventually selected (once the project is declared “Ready-to-List” and bids are solicited and the project awarded) will need as much as a year to order the 7-foot-diameter steel sheet piles and have the pile sections shipped to the construction site.

Caltrans notes that In the case of a bridge project constructed for Caltrans by MCM Construction between 2003—2005 at the Stony Creek Bridge, one of the few other locations in California where Caltrans has called for steel shell piles as large as the proposed for the Mad River project (See Exhibit 3), the contractor required a year to have the sheet metal for the piles specially fabricated in the eastern United States, then shipped by rail to southern California where the sheets were formed into cylinders and then shipped (in 80-foot sections for that project, but likely in 40-foot sections for the Mad River Bridges according to Caltrans staff⁸) to the project site.

⁸ Communication of Caltrans Project Manager Richard Mullen and other Caltrans project staff at meeting with Commission staff, December 4, 2007.

"Vegetation Removal: The trees will be limbed by a climber or from a bucket truck, then cut at the base and fallen. Limbs 4" or smaller can be chipped for later use as mulch. Tree removal equipment may consist of a boom truck, 10 yd. dump truck, chain saws, and chippers. In the southeast quadrant, limbing and brush removal would occur between the existing fence lines. No vegetation removal would be needed in Year 1 for the northeast quadrant."

"Residential Structure Demolition and Clearance Work: The work to be done, in general, consists of the removal and disposal of asbestos containing material and peeling/flaking lead paint, demolition, removal and disposal of a residential home site and six chicken coops. Site-specific demolition activities are outlined as follows:

- The disconnection and capping of utilities including: gas, water, septic and electricity.
- Abatement of all asbestos containing material, friable and non-friable as well as lead containing material according to GEOCON Site Survey Report, Project #8875-06-13, with consideration given to state and local regulations and all environmental laws prior to beginning demolition work.
- The removal of a 1,456 square foot house of wood construction on post and pier foundation including walls, siding, foundation and footings.
- Removal of six chicken coops and fencing surrounding said chicken coops.

Storm Water Pollution Control:

- The Contractor must comply with the water pollution control requirements as described in the National Pollutant Discharge Elimination System (NPDES) and the NPDES Permit for General Construction Activities.

License Requirements:

- Contractor must possess a C-21 Building Moving/Wrecking, Asbestos Removal Certification and Hazardous Waste Removal Certification.

Insurance Requirements:

- The Contractor shall furnish to the State a certificate of insurance stating that there is general liability and automobile liability insurance presently in effect.

Special Provisions:

- The Contractor shall make written notification to the nearest Cal/OSHA district office 24 hours prior to the asbestos related work and certain lead-related work in accordance with Title 8, CCR 341.9 and Title 8, CCR, Section 1532.1 (p) respectively.
- The Contractor shall make written notification to the U.S. EPA Region IX and the California Air Resources Board ten working days prior to commencement of demolition activities.

Method of Demolition:

- The methods used for the demolition and clearance of the residence will be dependent on how much of the residence can be salvaged. It is common for contractors to salvage and recycle the portions of a residence that have value as a means of offsetting demolition costs and reducing disposal costs. Items that may be salvaged or recycled include: windows, doors, wood and wiring.
- The materials used in the construction of the chicken coops will probably not be salvaged due to the low quality of the materials employed and their exposure to the elements, which have led to their premature decay.

Exclusion of Nesting Birds Prior to Bridge Demolition

"During field reviews conducted in the spring/summer of 2005, less than 20 nests in total were found on the two existing bridge structures. Nests were of several types (barn swallow – mud cup, cliff swallow – mud "gourd", as well as grass nests) and were found widely spaced. Existing bridges are slated for demolition in project construction years 3 and 4. The construction contractor will be required to remove nests on the existing structures during the period September 1 through March 1, prior to demolition of bridge structures and then maintain the bridges nest free through daily monitoring and removal activities through the end of the breeding season or demolition of the structure, whichever comes first."

"As an alternative the contractor may choose to demolish the structure(s) during the period September 1 through October 14. (This window avoids impacts to both nesting birds and salmonid species)."

Proposed Low-water Crossing (Summer Bridge)

"The low-water summer bridge crossing is as previously described and approved by NOAA-Fisheries except that water diversion is likely to occur as described below."

In-Channel Work and Windows

"Work within the river channel will include construction of cofferdams, false work, bridge piers, existing pier/footing removal, summer crossing, temporary construction access, water (river) diversion and possible settling basins (see page 15 for description of Fish Exclusion During Pile Driving). To minimize bio-acoustic impacts, pile driving of CISS piles at piers 3 and 4, as well as any cofferdam construction around the existing piers on the river's north bank that requires the in-water installation of sheet piles, will be limited to the period of July 1 – September 1. Construction will be allowed on gravel bars below the level of ordinary high water but above the wetted channel (active flow) during the period May 1 to June 16 with the following conditions:

- 1) A ten-foot buffer will be implemented from the waters' leading edge to the edge of any construction activities;
- 2) Best management practices (controls) will be on-site, ready to be deployed in the event of summer storms, and
- 3) The contractor will be required to button-up the site if there is a forecast of 30% or greater chance for precipitation. Work shall not resume until precipitation ceases, the forecast for potential precipitation decreases below 30%, and soils are not saturated as defined by pooling and running off the site."

"A work window of June 16 to October 14 will be utilized for all in-stream (wetted channel) project activities. Caltrans will specify the use of water bladders only below the level of active flow for the purpose of diverting water for construction. Clean gravel may be utilized above the elevation of the active flow for diversion purposes."

"Installation of a stream diversion to allow necessary construction activities will occur at the beginning of the in-stream construction season (beginning June 16) and will be kept in place throughout the entire construction season (ending October 14) in each construction year. When the diversion is deconstructed at the end of each season, the dry gravel bar will be graded to prevent fish impoundment."

Standard Impoundment/Channel De-watering

"Proposed impoundments and channel de-watering have been revised to afford more practical construction than previously proposed methodology (use of water bladders within elevation of live-flow, and clean gravel above elevation of live-flow)."

"Dewatering for low-water summer crossing: Water bladders will be used to isolate an area from the live stream flow to facilitate construction of the summer bridge abutment fills. Fish rescue will be performed. River-run gravels will be backfilled into isolated area. Stream will be necked down to no less than 50-ft."

"Dewatering for pier construction: Water bladders will be used to isolate an area from live flow. Fish rescue will be performed. A cofferdam will be installed. At all dewatered pier locations (other than the new Pier 4) river-run gravels⁹ will be backfilled into isolated area around the cofferdam. (At Pier 4, only clean washed gravels will be used to back fill isolated area around the cofferdam.) Piles will be driven."

"Dewatering for existing bridge pier/footing removal: Water bladders will be used to isolate an area from live flow. Fish rescue will be performed. Sheet piles will be vibrated in to form the cofferdam. Pier removal will proceed. Concrete footings at piers 6, 7, 8 and 9 will be completely removed."

⁹ (Caltrans states that) River-run gravels are necessary for construction because of their greater compaction strength (fines included). All river-run gravels used in construction will be removed from the channel, prior to October 15.

"Dewatering for construction of scour feature: Water bladders will be used to isolate an area from live flow. Fish rescue will be performed. "Wet" work will then proceed. In all instances where water bladders are proposed for use, Caltrans proposes alternatively pushing out clean gravel if river conditions are too deep for installation of the water bladders. (According to Caltrans) the National Marine Fisheries Service (Dan Free) and the California Department of Fish and Game (Scott Bauer) would not require removal of such gravel fill if used."

Staging Areas/Access Roads

"Construction staging areas will be located on the west side of Route 101, on the north and south sides of the river. The edge of the staging areas will be at least 50 feet from the waterway (top of river channel bank). It is anticipated that principal access to the Mad River channel will be from Staging Area 1 located on the South Bank, west of SR101. The lower portion of the existing access on the South bank, east of SR101 will also need to be widened for demolition of the existing NB structure. Staging areas will be used by the contractor to store equipment and construction material, as well as to gain access to the construction area in the channel. All applicable best management practices for site access would be implemented in accordance with the most current Storm Water Pollution Prevention Plan (SWPPP)."

"Access is proposed as follows:

"In the southwest project quadrant, proposed access is off the existing southbound 101, just south of the bridges. Construction of a temporary access road will be necessary. Access may utilize an area proposed for a temporary construction easement to facilitate large equipment mobilization, thereby avoiding out-of-direction travel by large equipment on the highway itself. At the river's S/W bank, temporary fill within the channel will be required to facilitate construction of a temporary road allowing access into the channel."

"Access at the southeast project quadrant will be off Wymore Road, along an existing road under Route 101, which would be used by smaller construction vehicles. Demolition of the existing northbound bridges will require that an area of existing riparian vegetation be cleared to 40-feet off the existing northbound edge-of-deck. Also, at the river's S/E bank, temporary fill within the channel will be required to facilitate temporary access into the channel for bridge demolition."

"In the northwest project quadrant access will be off the existing southbound Route 101, just north of the bridges; utilizing newly acquired right-of-way, west of the highway.

Access will follow the proposed new fill slope, accessing the staging and construction area; stopping short of the river's top of bank."

"In the northeast project quadrant access to the construction site will be through a private parcel off North Bank Road (Route 200). A new temporary access road will provide access to the north staging and the construction/demolition area."

River Access

"River Access from Staging Area 1: Disturbance of vegetation for access construction will be limited to the clearing limits defined for construction of the new SB structure. The bank will be cleared of vegetation with as little disturbance to the bank material as possible. Minor grading of high spots in the upper vegetated area of the bank may be needed to reduce steepness and fill volumes. No grading of the native bank material will be done below OHW. All imported material will be river run gravel. Fill material will be placed, graded, and compacted to create an access road approximately 25 feet in width. The "footprint" of the access road will be 75 feet wide or less."

"River Access from the South Bank, East of SR 101: It is anticipated that the principal use of this access point will be to facilitate demolition of the existing North Bound Bridge. This additional access is required because the proximity of the new NB structure will preclude crane picks from the west of the existing NB bridge. Providing adequate working area adjacent to the structure for a crane minimizes the need for temporary falsework supports and in place dismantling of the truss structure. Crane access also enables the Contractor to disassemble the truss in a way that will yield reusable steel members."

"This is an existing gated access location that has been used in the past for Caltrans Maintenance and Geotechnical equipment to access the river bar. In addition to clearing grass and brush from the existing road, widening would be performed on the portion of the bank riverward of Pier 6 of the existing NB Bridge. Vegetation removal for widening will be limited to a 40-foot wide section parallel to the eastern edge of the existing North Bound Bridge. Minor grading may be done to eliminate high spots and existing tire ruts. Imported material may be needed to stabilize the access area. All imported material will be river run gravels. Fill material will be placed, graded, and compacted to create an access road and working surface approximately 40 feet in width. The "footprint" of the access road will be 50 feet wide or less. Note: some fill material may extend under the existing bridge."

"River Access Road Removal: Prior to October 15th of each year the river run gravel fill used for the temporary access roads will be completely removed. Disturbance of the underlying native material will be minimized. The banks above OHW will be treated with the temporary erosion control. The bank below OHW will be cleaned of all loose

earthen material and left untreated unless bank areas need protection against scour by placement of temporary rock slope protection.”

Re-Fueling of Cranes on the Gravel Bar

“The project proposes the servicing of slow-moving, essential, track-mounted equipment on the gravel bar, within the river channel, provided that the following conditions are strictly adhered to:

- a. The fueling operator will be commercially licensed to fuel over water with all necessary Best Management Practices (BMP’S) in place to provide fuel to the necessary equipment.
- b. The fueling operator will adhere to the following BMP’s:
 - All fueling will occur on level ground.
 - The crane body will be oriented such that any fuel spill would land between the tracks.
 - The crane will have a permanent secondary containment around the motor and fueling neck.
 - Additional absorbent sheeting will be immediately available adjacent to the crane weight deck.
 - Absorbent pads and boom will be placed in the crane’s secondary containment surrounding the motor and fueling neck, and will be capable of absorbing a minimum of 15 gallons of fuel.
 - Absorbent sheeting, approximately 3.5-foot by 8-foot will be placed on the ground under the openings from the weight deck.
 - Fueling personnel will be located at the fuel shut off switch on the fuel truck and at the fuel nozzle on the crane.
 - The operator manning the fuel shut off switch will have visual contact with the person operating the fuel nozzle.
 - Fuel “blowback” will be prevented by reducing the flow rate of fuel delivery.
 - A portable secondary containment (60 gallons minimum) will be placed on top of the absorbent sheeting, on the ground, between the tracks.

All equipment not in use will be stored within the designated staging areas.”

Dewatering to Uplands

"Irrigation of upland agricultural lands adjacent to the Caltrans right-of-way may be used to provide areas for infiltration of water from dewatering operations. Water will be distributed by pipe networks placed at grade and will be designed and sized such that no surface runoff will occur."

Drainage Features/Culvert Work

"Proposed drainage feature work differs from that described in the projects' Negative Declaration and Initial Study, however these changes will not adversely affect additional biological resources. Drainage work has been renumbered. Culvert work is proposed as shown on attached Drainage Layouts, as identified by drainage systems #1 through #10. Site photos are also attached.

"Culverts at drainage system #1, #3 and #6 will affect jurisdictional wetlands; impacts have been previously quantified (see the Mad River Bridges Supplemental Coastal Wetland Delineation [July 2007] for Impact Mapping and tables 1 and 2). Culverts at drainage systems #2, #4, #5, and #7 through #10, are within uplands and function to convey highway run-off only.

"Drainage System #1 – A new 450mm (18") by 29.5m (97') culvert will be installed underneath the proposed pedestrian path (PED 12). This culvert will tie into the existing 450mm cross drain at Station "W4" 7+43.5. This system will drain roadside drainage north of Route 200. See Drainage Profile and Layout sheet D-1. Proposed work will permanently affect an area of United States Army Corps of Engineers (USACE) jurisdictional wetland (Polygon 4). See Impact Mapping contained within the Supplemental Coastal Wetland Delineation.

"Drainage System #2 – The existing Drainage Inlet (DI) at Station "W6" 0+59 will be raised approximately .4m (16") to match the new profile of Alignment "W6". See Drainage Profile and Layout sheet D-1. This is a non-jurisdictional work area.

"Drainage System #3 – A new 1050mm (42") by 13.0m (43') culvert will be installed underneath the proposed pedestrian path to convey water from the two existing 600mm (24") culverts which cross under Route 200. Drainage System #1 will also be connected to this system, which will all drain into the proposed wetland. See Drainage Profile and Layout sheet D-1. Proposed work will permanently affect an area of USACE wetland (Polygon 4 – see Impact Mapping).

"Drainage System #4 – A new 300mm (12") slotted culvert will be placed along with an asphalt concrete (AC) paved ditch at this location on Route 200. This system will drain into the existing drainage inlet (DI) at Station "W4" 7+43.5 and be tied into Drainage

Systems #1 and #3. See Drainage Profile and Layout sheet D-1. This is a non-jurisdictional work area.

“Drainage System #5 – A new 900mm (36”) by 38.3m (126’) culvert will be connected onto an existing 600mm culvert to allow for drainage under the new alignment on Route 101 at Station “W1” 50+25. See Drainage Profile and Layout sheet D-2. This is a non-jurisdictional work area.

“Drainage System #6 – A new 450mm (18”) by 92.8m (305’) culvert will be installed to drain roadside drainage between the new ramps “W2” and “W5”. A new DI will be installed in this system at Station “W2” 6+66.6 for collection of drainage from the proposed bio-swale along ramp “W2”. This system will outlet at station “W2” 6+35.1. See Drainage Profile and Layout sheet D-2. This system will be mostly constructed in uplands but will outlet into a USACE wetland. Construction of the drainage will result in temporary impacts to an area of USACE wetland (Polygon 3 – see Impact Mapping).

“Drainage System #7 – A rock energy dissipater (constructed of rock slope protection) will be placed at the outlet of an existing 600mm (24”) down drain at Station “W2” 9+09.0 to reduce scour caused by roadside runoff draining at a steep angle. See Drainage Profile and Layout sheet D-3. This is a non-jurisdictional work area.

“Drainage System #8 – A new DI and 450mm (18”) by 15.5m (51’) culvert will be placed on the new ramp, at Station “W7” 0+60.0 to drain roadside drainage from Ramp “W2” and Ramp “W7”. See Drainage Profile and Layout sheet D-4. This is a non-jurisdictional work area.

“Drainage System #9 – Three new DI’s, two 450mm (18”) by 20m (66’) culverts, and one new 600mm (24”) by 31.2m (102’) culvert will be placed at Station “W1” 53+20.0 to drain the median for the new main line. See Drainage Profile and Layout sheet D-5. This is a non-jurisdictional work area.

“Drainage System #10 – A new DI will be installed in the existing 600mm (24”) culvert to drain roadside drainage between ramps “W2”, “W4”, and “W7” at Station “W4” 7+88.7. See Drainage Profile and Layout sheet D-1. This is a non-jurisdictional work area.

Agricultural Mitigation at the Shively Education Center

“Construction of the Mad River Bridges project will result in the permanent loss of 3.58 acres of prime agricultural land. Caltrans also has two other pending projects in the coastal zone that would have impacts to agricultural lands (HUM 101 Alton Interchange of up to 41.98 acres of prime agricultural land; and the DN 101 Klamath Grade Raise of up to 2 acres of non-prime agricultural land). Caltrans is proposing to mitigate for these agricultural losses by supporting the agricultural program of College of the Redwoods and its Shively Education Center.”

"The Redwoods Community College District (RCCD) accepted the estate of John M. Bianchi at his passing. The estate included approximately 35 acres of agricultural land located in the community of Shively, California. At this time, the property is managed for the use of the Sustainable Agriculture class and its Community Supported Agriculture (CSA) projects. The will of Mr. Bianchi specifies that RCCD use the site "to have students to study agriculture and any other matters;" and that "they should live on the little ranch if al [sic] all possible while they are studying." The mission of the Shively Educational Center is to provide educational support and leadership for agricultural, horticultural, and related industries, in support of communities within the district."

"The mitigation proposal is to establish an endowment with the College of the Redwoods Foundation. The \$2 million endowment would be used by College of the Redwoods solely for the following purposes:"

"\$1.5 million would be set aside, and the annual accrued interest would be used to support a full-time agriculture faculty position at College of the Redwoods specifically for the support of the agriculture program and Shively Education Center."

"The remainder of the endowment would be used for agricultural program enhancement and facility support services at the Shively Center, such as new or improved infrastructure at the Shively Center and transportation needs from the main campus to the Shively Center."

"This mitigation proposal would not be transferable to other applicants or agencies or to other Caltrans projects. The funds provided to the College of the Redwoods Foundation would not be refundable if one or both of the other projects (Alton Interchange and Klamath Grade Raise) are not completed."

Fish Exclusion During Pile Driving

"Caltrans, in consultation with National Marine Fisheries Service (NOAA-Fisheries) and the California Department of Fish and Game (CDFG) propose to exclude, to the extent feasible all federally and state listed juvenile and adult salmonids from the areas potentially impacted by acoustic noise from pile driving activities during construction of the replacement of the Mad River Bridges. The area of potential disturbance from acoustic noise (187 dB SELaccumulated) is currently projected to occur within the project area both upstream and downstream of pile driving activities. Fish exclusion will commence prior to the pile driving work window, which begins July 1 during the construction of Pier 3 and Pier 4. The fish exclusion project described here is being undertaken in direct consultation with NOAA-Fisheries and CDFG in order to avoid and minimize potential harm to juvenile salmonids and other aquatic life forms, and was determined to be the most prudent to reduce potential sublethal and lethal impacts during pile driving activities."

"Fish movement into the area of potential bioacoustic disturbance will be restricted via a fish weir structure that will be placed upstream and downstream of pile driving activities

to establish a fish exclusion zone (FEZ). In addition to the weir structure at each end of the FEZ, a migration channel will be constructed to allow fish passage when it is determined by Caltrans and the contractors that there will be a sufficient hiatus (1-2 weeks) in pile driving to allow fish access to habitats located upstream and downstream of the FEZ. Once the fish weir and migration channel are in place, fish and other aquatic organisms (e.g., amphibians) will be removed from the FEZ using techniques approved by professional fisheries biologists in consultation with NOAA-Fisheries and CDFG. The net-weir will be monitored on a regular basis both above and below the water surface to ensure its integrity and clear any debris that may be present while it is in place. Fish exclusion structures and fish removal operations will begin with sufficient time (approximately 5 days) each season prior to pile driving to ensure that the maximum number of fish and other aquatic organisms are safely re-located to suitable habitats outside of the FEZ."

"Several temporary stream habitat alterations will be necessary to assist in the removal of fish from the FEZ and also to augment stream habitat downstream of the FEZ. There is a deep scour hole located near the southbound bridge within the FEZ(s) that was identified as too complex to facilitate the efficient removal of fishes. ~~As a consequence, it was determined in consultation with NMFS and CDFG that the deep scour hole be filled with a water bladder each year prior to fish removal.~~ (This deletion was submitted by Caltrans December 14, 2007) In an effort to mitigate for temporary habitat losses within the FEZ, stream habitat downstream will be augmented with structures in accordance with an approved Mad River Bridge Replacement Project Fish Exclusion and Monitoring Plan. This plan will include provisions for an adaptive management process to allow flexibility in order to ensure efficient construction of all structures that will provide a maximum level of protection to sensitive species as well as a contingency plan in the event of structural failure. Currently, it is anticipated that a complete description and analysis of all components of the fish exclusion project will be required per a CDFG Lake and Streambed Alteration Permit term and condition."

Caltrans has deleted a previous proposal to extinguish existing channel habitat that attracts fish by dumping extensive amounts of gravel "icing" on the subject channel locations to "simplify habitat" as noted in ~~strike-through font~~:

"Please see enclosed document titled Fish Exclusion to Avoid and Minimize Bioacoustic Impacts to Salmonids During Pile Driving During the Construction of Mad River Bridges for a more detailed description and analysis of the project." (Attached as Exhibit I)

"All work associated with this element of the project will occur within the work windows previously mentioned in this document. Channel access to construct and maintain FEZ structures have been identified. ~~Work associated with the habitat simplification of RSP on the north bank of the channel will be done within the Caltrans right-of-way and occur with minimal disturbance to the riparian vegetation (i.e., no vegetation removal is anticipated).~~" (Caltrans submitted this deletion on December 14, 2007)

“Potential conflicts between FEZ structures and recreational boaters may occur due to the location of the fish weirs, which will temporarily (approximately late-June to September 1) restrict upstream and downstream river access in the vicinity of the project area. In order to minimize any potential conflicts, Caltrans will issue public notices both onsite and offsite (e.g., local media, signs at popular boating put-ins and take-outs) to inform the public of the need for these temporary closures. In addition, if site conditions are feasible, Caltrans will provide portage locations around the fish exclusion weirs to allow boaters (e.g., rafts, kayaks, and canoes) to pass through the FEZ.”

Caltrans additionally states that an amended or new lease from the California State Lands Commission may be necessary in light of the exclusion measures (boating and fishing would be restricted from the FEZ as well) and more extensive work within the river corridor than had previously been disclosed by Caltrans at the time the existing lease was granted.

Supplemental Reports and Exhibits

“The reports listed below have been submitted that provide more detailed information in support of this project description.”

(The listed reports are included as Exhibits to the staff reports: See Exhibits A - & and AA—EE)

“Construction Access Map
Marine Mammal Monitoring Plan
Fish Exclusion to Avoid and Minimize Bioacoustic Impacts to Salmonids During Pile Driving During the Construction of Mad River Bridges, December 6, 2007
Bioacoustic Footprint and Proposed Fish Exclusion Zone Map
Constructibility Alternatives Analysis
Fish Weir Background Information
ADL Mapping
Analysis of Pile Driving Noise Impacts to Listed Salmonids for the Mad River Bridge Replacement Project. August 23, 2007 (Revised November 5, 2007)
Supplemental Pile-Driving Noise Analysis for the Mad River Bridge Replacement Project – DRAFT: November 2, 2007
Mad River Bridge Replacement Project: Evaluation of Underwater Noise Generated by Use of Smaller Piles (30-inch-Diameter) – DRAFT: November 6, 2007
Mad River Bridges Replacement, On-Site Wetland and Riparian Mitigation and Monitoring Plan, November 2007
Old Samoa Parcel Conceptual Mitigation Plan, November 2007
Water Pollution Control Program for Mad River Bridge – Brushing Only”
(and Mitigated Negative Declaration, Mad River Bridges, Caltrans June 17, 2005)

4.3 CONFORMITY TO THE COASTAL ACT, CHAPTER 3

4.3.1 WETLAND FILL, WATER QUALITY, STREAM ALTERATION, and ENVIRONMENTALLY SENSITIVE HABITAT/SPECIES

4.3.1.1 Standard of Review: Applicable Coastal Act Definitions and Policies

Chapter 2 of the Coastal Act establishes the following pertinent definitions:

Section 30106 of the Coastal Act defines development, in part, as:

“removing, dredging, mining, or extraction of any materials.”

Section 30108.2 of the Coastal Act defines fill as:

“the placement of earth or other substance or material in a submerged area.”

Section 30107.5 Environmentally sensitive area

“Environmentally sensitive area” means 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.

Section 30108 Feasible

“Feasible” means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors.

Chapter 3 of the Coastal Act sets forth the following pertinent policies and provisions:

Sections 30230 and 30231 of the Coastal Act address the protection of coastal water quality and marine resource:

Section 30230 states:

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 states:

The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of wastewater discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantially interference with the surface water flow, encouraging, wastewater reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

Section 30233 of the Coastal Act provides as follows, in pertinent part:

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

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

Section 30240 of the Coastal Act addresses the protection of sensitive habitat and species, and states in pertinent part:

(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.

The Coastal Act additionally recognizes the importance of, and protects, fishing:

Section 30234.5 Economic, commercial, and recreational importance of fishing

The economic, commercial, and recreational importance of fishing activities shall be recognized and protected.

Section 30235 Construction altering natural shoreline

Revetments, breakwaters, groins, harbor channels, seawalls, cliff retaining walls, and other such construction that alters natural shoreline processes shall be permitted when required to serve coastal-dependent uses or to protect existing structures or public beaches in danger from erosion, and when designed to eliminate or mitigate adverse

impacts on local shoreline sand supply. Existing marine structures causing water stagnation contributing to pollution problems and fish kills should be phased out or upgraded where feasible.

Section 30236 Water supply and flood control

Channelizations, dams, or other substantial alterations of rivers and streams shall incorporate the best mitigation measures feasible, and be limited to (1) necessary water supply projects, (2) flood control projects where no other method for protecting existing structures in the floodplain is feasible and where such protection is necessary for public safety or to protect existing development, or (3) developments where the primary function is the improvement of fish and wildlife habitat.

Section 30240 Environmentally sensitive habitat areas; adjacent developments

(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.

4.3.1.2 Analysis

The above policies set forth a number of different limitations on what development projects may be allowed in coastal wetlands, sensitive habitat areas, and coastal waters, or that may affect sensitive species. In situations, as here, where the impacts occur in a wetland area that is also ESHA, the more specific provisions of section 30233 control over the more general provisions of 30240. For analysis purposes, the limitations can be grouped into four general categories or tests. These tests are:

- **that the purpose of the filling, diking, or dredging is for one of the specific uses allowed (Section 30233);**
- **that the project has no feasible less environmentally damaging alternative (Section 30233);**
- **that feasible mitigation measures have been provided to minimize adverse environmental effects (Section 30233); and**
- **that the biological productivity and functional capacity of the habitat shall be maintained, enhanced and restored (Sections 30230, 30231).**

Permissible Use for Fill of Wetlands

Caltrans proposes to install the foundations for the proposed bridges within the Mad River corridor, in areas delineated as wetlands. Therefore, the proposed project constitutes the dredging and filling of wetlands as defined by the Coastal Act and is subject to review by the Commission for consistency with the requirements of Coastal Act Section 30233 and other applicable policies and provisions of the Coastal Act.

The **first test** under Section 30233 for such a project is whether the fill/dredging is for one of the allowable uses under Section 30233(a). The relevant category of use listed under Section 30233(a) that relates to the proposed bridge replacement is subcategory (4), stated as follows:

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

Thus, the Commission must determine whether the fill associated with the proposed project is for a use allowable under Section 30233(a)(5), i.e., that it is for a public purpose, and in addition, that it is for an "incidental" public purpose.

The Commission has in the past determined that the fill for certain highway safety improvement projects that did not increase vehicular capacity was considered to be for an "incidental public service" pursuant to the requirements of Coastal Act Section 30233(a)(4). In reaching such conclusion, the Commission has typically determined that a bridge replacement is a public safety project -- and thus is undertaken for a public purpose -- and further, that the project is incidental to "something else as primary." That is, the project is a public safety project incidental to the primary transportation service provided overall by the existing highway. This finding is supported in part on the basis that the subject bridge project is not part of new route or highway expansion.

As such, the proposed project -- the replacement of the existing bridged crossing of the Mad River on Highway 101 -- is for an incidental public purpose within the meaning of Section 30233(a)(4).

Conclusion: first test under 30233 (allowable use)

Therefore, for the reasons set forth above, the Commission finds that the proposed project constitutes an incidental public service, and thus **is an allowable use** for placement of fill within a wetland, pursuant to Section 30233(a)(4) of the Coastal Act.

Feasible, Less Environmentally Damaging Alternatives to the Proposed Project

The **second test** of Section 30233(a) is whether there are **feasible less environmentally damaging alternatives** to the proposed project. Coastal Act Section 30108 set forth above defines "feasible" as follows:

'Feasible' means capable of being accomplished in a successful manner within a reasonable time, taking into account economic, environmental, social, and technological factors.'

The Coastal Act requires, and widely accepted principles of sound environmental planning – including those principles incorporated into the California Environmental Quality Act (CEQA) additionally dictate-- that adverse impacts on the environment be avoided if possible as a first priority when considering a proposed project.

Where a searching analysis determines that adverse impacts on the environment posed by the proposed project cannot be feasibly avoided through the selection of a different alternative, the Coastal Act, CEQA, and environmental planning principles further require the further consideration of alternatives that would reduce the unavoidable adverse impacts on the environment posed by the subject project.

Only after determining that a proposed project's adverse impacts on the environment cannot be feasibly avoided or further reduced does the consideration of mitigation for adverse impacts arise, as discussed below.

Therefore, the Commission must undertake a hierarchal alternatives analysis that would: a) avoid adverse impacts on the environment, and b) reduce adverse impacts. If the Commission cannot, through such analysis, conclude that the proposed project is one for which "there is no feasible less environmentally damaging alternative" then the Commission must deny the proposed application for the subject coastal development permit and the further review required under Coastal Act Section 30233 is terminated.

If, however, the Commission analyzes the alternatives to the project and determines that there is no feasible less environmentally damaging alternative, then the Commission review of the subject project proceeds through the remaining tests of Section 30233 and the other applicable policies and provisions of the Coastal Act.

Thus, the second test of Coastal Act Section 30233 – the alternatives analysis -- requires that the Commission examine all feasible alternatives to the proposed project that would avoid or reduce the project's adverse impacts on coastal resources, as set forth below.

Proposed Project: The applicant has submitted a series of revised project descriptions for the proposed project, but the fundamental proposal to replace the two existing bridges with a new, wider pair of bridges west of the existing crossing remains more-or-

less the same since it was identified as the leading alternative by Caltrans in 2003 (see also the Mitigated Negative Declaration, June 17, 2005, approved by Charles C. Fielder, Director, District 1, Caltrans, and attached hereto as Exhibit A).

Based on the most recent information submitted by Caltrans, the four most significant adverse impacts that the proposed project would have on coastal resources include:

1. Disturbance of the Mad River channel habitat, which includes essential fish habitat, and potential water quality impacts.

- 2.1 acres (8.5 acres total) of disturbance within the river channel annually for approximately four construction years for temporary crossings and construction areas sufficient for the pair of large cranes and massive diesel impact hammer necessary to drive 7-foot-diameter steel shell piles. (previously scoped by Caltrans as 0.6 acres).
- Caltrans did not previously, and does not presently propose any mitigation for this impact.

2. Permanent Impacts to wetlands, including riparian habitat within the Mad River corridor.

- approximately 2 acres of wetlands would be permanently impacted. (previously scoped by Caltrans as less than one acre).
- Caltrans presently proposes to mitigate 1:1 by replanting wetland vegetation on-site and to mitigate an additional 3:1 offsite; Caltrans previously proposed to mitigate off-site by planting riparian species around stormwater runoff ponds owned by the McKinleyville Community Services District.

3. Permanent conversion of prime agricultural lands

- 3.58 acres of prime agricultural lands would be permanently converted to highway use, slightly more than Caltrans originally estimated.

4. Hydroacoustic impacts to fish and other species associated with pile-driving 7-foot-diameter steel shell piles (as well as smaller temporary piles) for the bridge foundations.

- Caltrans biologists estimated in July 2007 that 10,000 to 50,000 state and federally listed salmonids could be killed directly by two seasons of the proposed pile-driving if conducted as proposed by Caltrans, without any additional protective measures.
- Caltrans did not identify this impact in the Mitigated Negative Declaration or the application for the subject coastal development permit, or in any state or federal applications for project review, and therefore proposed no mitigation prior to a series of iterative proposals submitted and refined between August 2007 and the present.

- Caltrans previously proposed to reduce the impacts to salmonids that would otherwise occur if pile driving near Piers 3 and 4 is undertaken without measures to exclude fish from the hydroacoustic impact hazard footprint by building a "Fish Exclusion Zone" of weirs and nets up and down river as much as 200 linear meters (1,312 linear feet) upstream and downstream from the pile-driving source, and to install a 3-foot-wide fish migration passageway down the center of the stream corridor for intermittent fish passage when pile-driving is interrupted. These measures are somewhat experimental (but would be monitored and managed adaptively), and the installation and depopulation will result in take of species.

Caltrans presently proposes, in accordance with revisions submitted to the Coastal Commission staff on January 8, 2008, to reduce the impacts to salmonids by constructing a "Fish Exclusion Zone" (FEZ) of only 150 linear meters upstream and downstream from the pile-driving proposed at Piers 3 and 4, and by limiting pile-driving to a maximum of two approximately 40-foot-long, 7-foot-diameter, steel shell pile sections per day.

Based on revised estimates submitted by Caltrans on January 9, 2008 and shown in Addendum Exhibit FF, Caltrans estimates FEZ limits for various pile-driving scenarios and rough estimates of fish within each FEZ (these numbers would be doubled for two years of proposed pile-driving) include:

One-pile-section-per-day: 180 linear meters total FEZ: 429 fish present.

Two-pile-sections-per-day: 300 linear meters total FEZ: 598 fish present.

Three-pile-sections-per-day: 400 linear meters total FEZ: 1,198 fish present.

The four key impact areas do not represent the only project impacts, but the most significant impacts, and thus the impacts of most interest for purposes of the **second test** under Coastal Act Section 30233: that is, **whether there are feasible alternatives to the proposed project that would avoid or reduce the project's adverse impacts on coastal resources.**

Evaluation of Potential Alternatives

The following potential alternatives to the proposed project have been identified, evaluated for potential to avoid or reduce the project's adverse impacts on coastal resources, and tested for feasibility by Caltrans:

Alternative 1: No project (retain existing bridges). The no-project alternative would retain the two existing bridges, which, as explained in the "purpose" section of this report, would not provide the scour and seismic remediation deemed necessary by Caltrans to ensure public safety. The existing bridges are aging, unstable, outdated, and structurally deficient according to Caltrans. Therefore, although the "no project" alternative would avoid most of the significant, adverse impacts to coastal resources that are posed by the project presently proposed, this apparent benefit would disappear

if the bridges ultimately fail. Such failure would result in the need for emergency replacement of the bridge(s) and the subject construction would almost certainly take place within the sensitive habitat of the Mad River corridor without the detailed advanced planning and mitigation that would otherwise occur through the customary regular permitting process. Further, Caltrans determined that this alternative was infeasible as it did not meet the stated purpose and need of the project. Therefore this alternative is not a lesser environmentally damaging feasible alternative to the proposed project as conditioned.

Alternative 2: Build a single bridge on one foundation system, instead of a pair of bridges as proposed. This alternative would recycle most of the footprint of the bridges in the existing crossing locations through some form of the construction technique known as "half-width construction." This is a common method of bridge installation where space is severely constrained for some reason, and is technically possible at the subject location. Conserving the footprint of disturbance of the existing bridges would reduce the total extent of agricultural impacts and the removal of wetland vegetation, but would likely not change the extent of stream channel impacts during construction. If it is assumed that the pile sizes would be the same as presently proposed, this alternative would likely have impacts on listed salmonids and other aquatic organisms similar to those posed by Caltrans' proposed project.

Half-width construction typically requires one-way traffic control, detours, or both. The proposed project is projected to require at least four (4) years – and possibly five (5) years to complete construction. Caltrans has determined that one-way traffic control or shrinking the U.S. Highway 101 down to even one lane in each direction, for such an extended period of time, would cause significant traffic back-ups and/or would induce drivers to seek alternative routes, thereby overcrowding frontage roads that are not designed to safely handle such significant overflow. This means that the safety risks of traffic management necessary to undertake half-width construction and build the new bridge as one wider bridge rather than two separate bridges would be unacceptable. For this reason, Caltrans determined that this alternative is infeasible. Therefore this alternative is not a lesser environmentally damaging feasible alternative to the proposed project as conditioned.

Alternative 3: Build the new bridges on the east side of the existing crossing, instead of the west side as proposed. Caltrans considered this alternative, but determined that the impacts on agriculture and wetlands would be the same as, or potentially worse than, the project as proposed. Stream channel impacts and impacts to fisheries, etc., would otherwise be similar to those posed by the proposed project. Caltrans rejected this alternative because it represented no savings in environmental impacts and could have required removal of an architecturally significant farmhouse, and a dairy, and would not have favorably resolved the geometric (alignment) issues that Caltrans finds necessary to improve operational conditions and thus protect public safety. Caltrans determined that the impacts of this alternative would likely be worse than those posed by the proposed project and that this alternative would not fully meet

the operational improvements Caltrans seeks. Therefore this alternative is not a lesser environmentally damaging feasible alternative to the proposed project as conditioned.

Alternative 4: Build the new bridges with more, but smaller piles grouped together in concrete footings excavated below the river bottom/covered up by river gravels after construction (Caltrans is currently using this method to build new highway bridges over the Van Duzen River, on Highway 101 in Humboldt County near Fortuna, and over the Ten Mile River on Highway 1, in Mendocino County, north of Ft. Bragg). This alternative relies on conventional pile-driving techniques but with the use of a smaller diesel impact hammer that could be rigged with a conventional one-crane system (thus reducing the footprint of impacts associated with heavy-sized construction equipment in the channel and reducing the amount of access grading and vegetation preparation necessary to get the equipment in place).

The primary potential benefit of this alternative centers on the reduced size of the piles necessary to construct the bridges under this option and resultant potential reductions in the related hydroacoustic impacts on fish. The smaller piles can also be installed through the use of one ordinary crane, rather than the two large cranes that are required just to lift the oversized impact hammer that is necessary to drive 7-foot-diameter heavy piles (to drive 8-foot-diameter piles for Stony Creek Bridge in Glenn County, the Caltrans contractor used a hammer that weighed about 250,000 pounds- See Exhibit 3).

The difference in scale between the equipment necessary to install 30-inch-diameter piles versus 7-foot-diameter piles would reduce the extent of impacts within the stream channel (see Exhibit 3 for a series of photographs of a Caltrans bridge installation that used the heavy piles – staging and construction footprint is proportional to the number and size of the pieces of equipment necessary to undertake the work).

On the other hand, the use of smaller piles requires that many more piles be installed. Caltrans estimates that twenty 30-inch-diameter steel shell piles would be necessary to replace one of the 7-foot –diameter piles that Caltrans proposes to use for the Mad River Bridges.

The agricultural and riparian wetland impacts of this alternative are unlikely to be reduced significantly compared to the extent of the impacts to these resources posed by the proposed project. The principal difference between Alternative 4 and the proposed project is that Alternative 4 would have a lessened in-channel physical disturbance footprint due to the reduced size and number of cranes, etc., that would be required. Peak decibels generated by pile-driving would also be reduced through Alternative 4 because of the likely reduction in sound impacts associated with hammering a more slender steel shell pile with a smaller impact hammer. As discussed below, however, Caltrans maintains that the increased number of smaller piles would result in a cumulative sound impact footprint that exceeds the cumulative sound impact footprint for the larger piles due to the increased number of total pile strikes Caltrans assumed would be required for the installation of the smaller piles.

Caltrans retained consultants to prepare a draft hydroacoustic impact analysis of this alternative at the request of Commission staff (Exhibits E, F, and G contain the hydroacoustic impact reports and supplement). The consultants concluded that while peak decibels would be reduced through the use of the smaller piles, cumulative sound impacts would be increased under this alternative because it would require more hammer blows to set the smaller piles.

Commission staff and the staff of the National Marine Fisheries Service questioned the Caltrans' consultants' conclusions, however, because among other issues, the consultant's conclusions were based on a limited sample of pile-driving data generated on the Ten Mile River project during 2007, where pile driving difficulties have resulted in the need to use far more total hammer strikes per pile in some locations than even Caltrans previously predicted. This is not likely to be a normal pile-driving outcome, but rather represents site-specific problems at the Ten Mile location. Caltrans determined, however, that only empirical data drawn from riverine pile-driving could be used to estimate the cumulative hydroacoustics footprint. This restriction makes the analysis difficult because although Caltrans has numerous examples of projects where such pile-driving has occurred, Caltrans rarely monitors the hydroacoustic impacts produced by these projects, and thus there is a dearth of empirical evidence that meets the standard Caltrans imposed. The standard of only relying on empirical data, therefore, can have the consequence of skewing the data because the limited sampling available has been taken from a context that may not likely to represent other sites (such as the Mad River) accurately.

However, without prejudice to the ultimate resolution of whether a higher number of smaller piles would produce greater cumulative pile-driving impacts compared with fewer, but much larger steel shell piles (driven at the same location), Caltrans eliminated this alternative from further consideration for unrelated reasons. Caltrans determined in September 2007 that pursuing the ultimate answer to the hydroacoustics comparison question was not important (and thus Caltrans did not direct that the draft reports for the smaller piles be finalized) because Caltrans had other reasons, amounting to dismissal for feasibility, that are more fully explained in the five-page "Caltrans District 1 Response to California Coastal Commission Staff Request for More Information on Mad River Bridges – Constructibility/Alternatives Analysis" attached hereto as Exhibit M.¹⁰

The primary reason that Caltrans deems the use of smaller piles to be infeasible does not relate directly to hydroacoustic issues. The smaller piles require the installation of a concrete footing to spread bridge load among the group of piles, and although this footing would be finished at an elevation completely covered afterward by the natural river channel (and thus would be "ecologically invisible"), Caltrans believes that river scour is still occurring in the Mad River and that such a footing could eventually be

¹⁰ Caltrans notes that Exhibit M was principally prepared by Matt Brady, a licensed professional engineer and the Assistant Director of Caltrans District 1. Mr. Brady indicates that his contribution to Exhibit M was specifically the "constructability" analysis.

exposed. Although others dispute that scour is continuing in the Mad River, Caltrans points to site-specific evidence that scour is continuing within the Mad River at the very location of the Mad River bridges (Exhibit M). Therefore, based on this site-specific evidence and Caltrans' bridge analysis expertise, Alternative 4 is infeasible. Therefore, this alternative is not a less environmentally damaging feasible alternative to the proposed project as conditioned.

Alternative 5: Build the new bridges with smaller piles as above, but install the piles via the use of "Silent Piler Technology" that, where deployed, virtually eliminates hydroacoustic impacts at levels of biological concern. (See Exhibits 4 and 5). This alternative would rely on a different type of pile installation system that does not require impact hammering to drive in piles. The principal benefit of this would be the elimination of most -- if not all -- of the biologically significant levels of hydroacoustic impacts that arise from impact hammer driving of even smaller piles.

Commission staff requested that Caltrans evaluate the alternative of using the "Silent Piler" technology, which relies on hydraulic installation as an alternative method of pile installation. Caltrans provided a supplemental alternatives analysis thereafter, (Exhibit M, November 2007) but the analysis was silent about the potential use of this technology. Additional information submitted by Caltrans in December 2007 provided no other consideration of Silent Piler technology (See Exhibits 4 and 5). However, other evidence in the record indicates that the reason Caltrans dismissed the Silent Piler without further analysis is because the Silent Piler may not have the capacity to drive the heavy 7-foot-diameter piles that Caltrans intends to use for the Mad River Bridges project. The Silent Piler technique has been approved for use by Caltrans (Exhibit 4) and has been deployed successfully (Exhibit 5) in actual projects, but appears to be a technology more suitable to the 30-inch-diameter piles. The Silent Piler for the same reasons that Alternative 4 was dismissed: the smaller piles would require a concrete footing that Caltrans deems unsuitable for the conditions in the Mad River and thus the method of installing the smaller piles, whether by impact hammer or hydraulic techniques, is rendered moot. The Silent Piler technique is considered to be infeasible on this basis. Therefore, this alternative is not a less environmentally damaging feasible alternative to the proposed project as conditioned.

Alternative 6: Build the new bridges with 5-foot-diameter steel shell piles (as used on the Humboldt Bay Bridges) instead of the proposed 7-foot-diameter steel shell piles. Construction could be managed with conventional single crane system, pile-driving acoustic impacts would be reduced but by an unknown amount. This alternative would not reduce the agricultural or riparian wetland impacts of the proposed project significantly, but is an alternative that relies on relatively heavy piles that can be installed with a relatively conventional crane-and-impact-hammer combination.

This alternative was demonstrated locally because on the Humboldt Bay Bridges, Caltrans initially considered using the 7-foot-diameter steel shell piles, but reduced the pile sizes to 5-foot-diameter. The reason that Caltrans made this change, according to District 1 staff, was because the oversized cranes and hammer that are necessary to

install the larger piles would not fit into the space available to stage construction at the Humboldt Bay Bridges site. Caltrans therefore reduced the specified pile size to 5-foot-diameter, demonstrating that the alternative of using the smaller (but still relatively large piles, compared to the 30-inch piles presumed in Alternative 4 above) steel shell piles could accomplish similar bridge foundation strength objectives and save on the construction footprint impacts through the use of smaller/fewer pieces of equipment.

However, Caltrans rejects Alternative 5 as infeasible: Exhibit M, page 5 of 5 states in pertinent part:

"The Humboldt Bay Bridges (HBB) project was a seismic retrofit project only, whereas the Mad River Bridges project also addresses scour. The HBB project was designed by a consultant engineering firm who initially designed the additional retrofit piles using 8-foot diameter piling. Upon plan review by in-house Caltrans engineers, Caltrans discovered that the consultant design team had designed the bridge for 1-hour serviceability after the maximum credible earthquake was experienced. It was supposed to have been designed for no catastrophic failure (big difference). Caltrans engineers, using 3-foot and 5-foot diameter piles so that the bridge could withstand the maximum credible earthquake without having catastrophic failure, redesigned the foundations."

This analysis indicates that since the Mad River Bridges are already designed to the catastrophic failure standard (the lesser of the two standards), 7-foot-diameter piles cannot be reduced to a smaller size – even to 5-foot-diameter piles, without compromising the already-downscaled "no catastrophic failure" standard to which the proposed Mad River Bridges are presently designed. Thus, the above citation supports the infeasibility of substituting Alternative 6 for the proposed project, despite a savings in the footprint of the project within the stream channel, as well as a potential reduction in the extent of hydroacoustic impacts that would result from the use of 3-foot or 5-foot-diameter steel shell piles instead of the 7-foot-diameter steel shell piles that Caltrans presently proposes. Therefore, this alternative is not a less environmentally damaging feasible alternative to the proposed project as conditioned.

Alternative 7: Build the bridges with piles made of other materials or installed by other methods. Anecdotal information suggests that there may be other materials (concrete piles) and other installation methods ("screw-in-the-ground" types of piles) that could reduce the hydroacoustic impacts of the proposed 7-foot-diameter piles. It is unlikely that these alternatives would significantly reduce other adverse impacts the proposed project poses on agriculture, riparian vegetation, or stream channel habitat, however. Caltrans states that no other feasible materials or installation methods of these kinds that would satisfy the requirements of the proposed Mad River bridges (Exhibit M, page 4):

"Screwed in piles, better known as "oscillated piles," such as Fundex Piles, were given consideration for the pier piles at Mad River Bridges. However, these types of piles do not have the capacity to withstand the bridge loads that will exist on the new Mad River Bridges. Each of the new bridges is designed to be supported on two

piers that bear huge loads at all but one support location. The bridges were designed this way to better resist the maximum credible earthquake for this area and to better pass the 100-year flood. Caltrans has only utilized this type of piling to date for casings, but not load bearing. According to Caltrans Geotechnical Engineers, the torque required for the top drive rig would also need to be well beyond what is currently available to reach design capacities.”

Therefore, this alternative is not a less environmentally damaging feasible alternative to the proposed project as conditioned.

Alternative 8: Build the bridges as presently proposed by Caltrans but restrict pile driving to a maximum of two 40-foot steel shell pile sections per day during the July 1 – September 1 pile-driving season established annually by the National Marine Fisheries Service, and implement Fish Exclusion Zone E as shown on Addendum Exhibit FF, a distance of approximately 150 meters upstream and downstream from pile-driving locations between proposed Piers 3 and 4. This restriction would reduce fisheries impacts associated with Fish Exclusion Zone D shown on Addendum Exhibit FF, by approximately 1,200 listed salmonids over two pile-driving seasons, according to the fish population estimates set forth in Addendum Exhibit FF. Caltrans has confirmed that this alternative could be feasibly implemented and would not be likely to extend pile-driving into a third season. Thus, this alternative reduces the total fish impacts that would be posed by a three-pile-section per day pile-driving schedule and thus represents a less environmentally damaging feasible alternative to the project as previously proposed by Caltrans.

Alternative 8 offers no differential reductions in impacts to three of the four key coastal resource impacts categories described above (agriculture, stream channel, riparian/wetlands), as compared with the proposed project. However, Alternative 8 would reduce fish exclusion impacts by reducing the accumulated hydroacoustic impacts that drive the spatial extent of the competing fish exclusion scenarios. Alternative 8 would not reduce the impacts of establishing the FEZ at the 90-meter footprint (180 linear meters, total) that would be required for driving only one pile section per day. However, Caltrans has presented evidence that such a limit would substantially increase the risk that construction delays would require pile-driving into a third season, and possibly even a fourth season due to sequential construction requirements. If even one additional FEZ season was required for the one-section-per-day scenario, Caltrans estimates that a total of 1,287 listed salmonids would be adversely affected. This compares with only 1,196 listed salmonids that Caltrans indicates would be affected by two seasons of the 150-meter footprint (300 linear meters, total) associated with the two-pile-section-per-day FEZ. Thus, Alternative 8 would substantially reduce the number of salmonids that would be affected by the hydroacoustic hazard footprint associated with limiting pile-driving to one 40-foot section per day of the proposed 7-foot-diameter steel shell piles, and would also substantially reduce the number of listed salmonids that would be taken to establish the larger FEZ

needed for the multiple (three)-pile-section-per-day pile driving scenario that Caltrans previously proposed.

Caltrans has stated that the agency prefers to leave decisions such as the number of pile sections that can be driven in a day to the choice of the eventually-selected contractor. Caltrans has stated that this is because the contractor may come up with a cost-savings idea when given maximum flexibility and allowed to implement a variety of potential options. Alternative 8 represents a significant reduction in the number of listed salmonids that would be harmed to establish the larger fish exclusion zone that would otherwise be required, however, and in addition, the smaller FEZ would be easier to manage, less of a challenge to clear of fish, and would avoid most of the particularly fish-rich habitat that lays just outside of the smaller FEZ but would be cleared to establish the larger FEZ. Thus, implementation of Alternative 8 would increase the chances for success of the FEZ method of protecting fish within the river, as compared with the FEZ necessary for a three-pile-sections-per-day pile-driving scenario, would reduce direct and indirect adverse effects on fish and other species, and would thus reduce the adverse effects on coastal resources as compared with the impacts that would result from the project as presently proposed by Caltrans (with larger FEZ). As described above, the two-section-per-day FEZ would also reduce the affects on listed salmonids that would be produced by the one-pile-section-per-day FEZ because the risk of a third or fourth year of pile-driving would be mostly eliminated by this scenario, according to Caltrans staff.

The Commission finds, therefore, that it would be a feasible, environmentally preferable alternative to require that pile-driving be limited where it could affect the river habitat, to a maximum of two forty-foot steel shell pile sections per day as required by Special Conditions 2 (Pile Driving) and 14 (Revised Plans). The Commission further finds that it is reasonable for Caltrans to require its eventually selected contractor to abide by this restriction, and that Caltrans would have sufficient notice of this limitation to include it in the appropriate bidding documents and eventual contract as required by Special Condition 7 (Construction Responsibilities). In this way, the bidders would be fully appraised of this limitation, and any loss of potential financial windfall the state and the contractor might secure from retaining unfettered flexibility to select other options would be offset by the protective effects of selecting Alternative 8 discussed above.

In addition, the Commission finds that Caltrans' desire to provide cost-saving incentives within construction projects does not override the applicability of the Chapter 3 policies of the Coastal Act in reviewing potential development within the coastal zone. That is, as previously stated, Coastal Act Section 30233 requires a searching analysis for feasible, least environmentally damaging alternatives. As discussed herein, Alternative 8 would feasibly reduce impacts on listed salmonids and environmentally sensitive habitat. In addition, and as is also discussed above, Special Condition 2 contains a limited exception provision for the Executive Director to grant relief from absolute pile-driving restrictions upon request and in light of an adequate showing of an

environmentally-protective basis for the request. This provision reduces the risk that Alternative 8 could render the project infeasible or force a third year of pile-driving. Therefore, for all of these reasons, the Commission finds that Alternative 8 would reduce the adverse impacts on coastal resources posed by the proposed project, and that the revision of the proposed project to limit the project to the construction of two pile sections per day/ as shown in Zone E of Addendum Exhibit FF is feasible and **represents a less environmentally damaging feasible alternative** when compared to the previously proposed project that included provisions to install up to three pile sections per day in the pertinent locations.

Conclusion: second test (alternatives)

Therefore, as discussed extensively above, the Commission has considered eight alternatives, including the no--project alternative and the proposed project. The Commission finds for the reasons set forth above that the no--project alternative is not a feasible, less environmentally damaging alternative to the proposed amendment. The Commission also finds, however, that there is one alternative, identified as Alternative 8 above, that would meet the purpose and need of the proposed project, and would also reduce the project's hydroacoustic impact-related footprint on the listed salmonids and other species that inhabit the waters of the Mad River. Alternative 8 is virtually identical to the proposed project except for one feature: pile-driving would be limited to two forty-foot-long sections of the proposed 7-foot-diameter piles per day instead of the multiple (three)-pile-section-per-day option that Caltrans originally proposed. Therefore, Alternative 8 is feasible, and demonstrates that a less damaging feasible alternative to the proposed project exists. Special Condition 2 requires that Caltrans limit installation of pile sections to two pile sections per day for pile-driving of piers that may produce hydroacoustic impacts of biological concern. Special Condition 2 also provides the means of securing a limited exception to this restriction, for cause, if a third year of pile-driving would thereby be avoided. **Thus, the Commission has identified a feasible, less environmentally damaging alternative to the proposed project.**

Feasible Mitigation Measures

The **third test** set forth by Section 30233 is whether feasible mitigation measures have been provided to minimize significant adverse environmental impacts.

Caltrans has determined that the Mad River bridges are structurally deficient: neither bridge conforms to contemporary scour, seismic, or geometric guidelines. Replacement of the structures is proposed to prevent further degradation of the bridges and to increase highway safety in the project area.

The project site is within the coastal floodplain, adjacent to the marine terraces of McKinleyville. (See Exhibits AA—EE, and the vegetation map/aerial photo in Exhibit B). The Mad River bridges span the Mad River approximately two miles upstream of the

river's terminus at the Pacific Ocean. In this section of rural highway, much of the landscape has been developed for agricultural use, with scattered rural residential housing and some inclusions of commercial uses. The greater project vicinity has been extensively manipulated such that natural vegetation and habitat types have become extirpated or fragmented. A well-developed riparian corridor exists adjacent to the river, which is primarily vegetated by red alder, Hooker's willow, and Pacific willow. A few mature black cottonwood trees and Oregon ash exist up and downstream of the existing bridges. The majority of riparian vegetation underneath the existing bridges is comprised of low-growing, shade-tolerant shrubs and herbs. Native species dominate the area under the existing bridges at the south bank, while non-native species are prevalent under the bridges on the north bank (primarily velvet grass and Himalayan blackberry). The riparian corridor is a component of designated critical habitat for the Southern Oregon/Northern California Coast ESU coho, as well as the California Coastal ESU Chinook and Northern California ESU steelhead.

Depending on the manner in which the proposed project is undertaken, as discussed above, the project may have significant impacts on a variety of coastal resources, including but not limited to wetlands/riparian habitat, agricultural lands, stream channel habitat, water quality, and anadromous fish. The potential impacts have been generally identified and discussed in this staff report and in the attached Exhibits (Exhibits AA-EE and Exhibits A—Y) and where potential impacts have not been fully identified due to the need to collect baseline information or mitigation has been deferred to await collection of pertinent impact data necessary to appropriately scope eventual mitigation, the attached Special Conditions have provided the means to evaluate the adequacy of mitigation measures through condition compliance.

The 20 attached Special Conditions, if fully implemented by Caltrans, will ensure that: project timing and implementation are undertaken consistent with a full range of measures to avoid or minimize adverse impacts to agriculture, wetlands, water quality, sensitive species, and cultural resources to the maximum extent feasible (Special Condition 1 – Timing of Construction Other Than Pile-Driving), that pile-driving is undertaken in the most protective manner feasible to reduce impacts on listed salmonids and other species in the Mad River compared to the impacts that would otherwise occur if the project were constructed as previously proposed (Special Condition 2 - Pile-driving); that all pertinent requirements imposed on the subject project by other state and federal agencies are considered (Special Condition 3: Final State and Federal Authorizations; Incorporation by Reference; Responsibility); that a fully developed hydroacoustic monitoring plan is prepared and implemented to protect listed salmonids and other species present in the Mad River environs (Special Condition 4: Hydroacoustic Monitoring Plan; Dual Metric Exposure Criteria); that Caltrans prepares an adequate mitigation plan for fish and other affected species, and a monitoring plan, and implements a fish exclusion zone protective of species in the river during pile driving (Special Condition 5: Mad River Fish and Other Affected Species Monitoring & Mitigation Plan); to ensure that project compliance with permit requirements protective of fisheries are monitored by a qualified biologist (Special Condition 6: Biological Monitoring: Fisheries); that a wide range of construction

responsibilities protective of water quality and habitat, including measures to require that lead-contaminated soils be adequately collected and properly disposed of as hazardous wastes, river channel activities be restricted and monitored to limit adverse impacts that may otherwise result to sensitive habitat and species, that fueling, materials storage, concrete pours, demolition, and numerous other specific aspects of project staging and construction be undertaken in a manner protective of coastal resources (Special Condition 7: Construction Responsibilities); that all disturbed areas of the site be successfully revegetated with locally appropriate and genetically compatible native plants and that non-native invasive species be controlled within the project boundaries and the cattle crossing presently causing water quality impacts be appropriately managed in the Caltrans right-of-way/below the proposed bridges (Special Condition 8: Final Revegetation and Erosion Control Plan); that drainage structures and culverts be designed to be wildlife compatible and to reduce the infiltration of pollutants from highway runoff into the Mad River (Special Condition 9: Drainage Structure Final Plan; Maintenance Responsibility); that Best Management Practices and other measures protective of water quality, such as limiting vegetation removal that could result in erosion, and providing for Executive Director review of the Storm Water Pollution Prevention Plan for adequacy to protect the water quality of the Mad River and nearby habitat, and to limit de-watering activities to pastureland areas for the protection of coastal waters and fisheries (Special Condition 10 – Water Quality Protection); to ensure that project activities are compliant with the requirements of the CDP 1-07-013 that protect coastal resources not specifically identified as fisheries (Special Condition 11: Biological Monitoring (non-fisheries)); to provide for site inspections, future public access and assumption of risk provisions that thereby ensure improved compliance, protect multi-modal public access to the transportation amenities approved herein, and to limit liability for risk management that is within the agency charge and expertise of Caltrans and upon which the Commission relies in approving this coastal development permit (Special Condition 12: Site Inspections; Special Condition 13: Protection of Future Public Access; Special Condition 17: Assumption of Risk); to require through a special condition for revised plans that the least visually-intrusive design of bridge elements, including bike rails and lighting, be chosen, require proper disposal of lead-contaminated soils; ensure that adverse affects on fisheries and aquatic habitat/species that may arise from the hydroacoustic impacts of pile driving are limited to the maximum extent possible by limiting the installation of pile sections to two per day (Special Condition 14: Revised Plans); to provide for a revised wetland plan that would not impermissibly convert excessive amounts of non-prime agricultural lands to non-agricultural uses and ensure that an alternative location for approximately 3 acres of compensatory riparian mitigation is undertaken at an ecologically appropriate location within the Mad River watershed and at a ratio of at least 4:1 and mitigation of stream channel impacts at a ratio of 1:1 (Special Condition 15: Revised Wetland/Stream Channel Mitigation Plan); provide that cultural remains, though not expected to be unearthed during project construction, would be appropriately evaluated through an amendment of CDP 1-07-013 should cultural remains be discovered during the course of construction (Special Condition 16: Cultural Remains); provide that Rock Slope Protection sought by Caltrans in 1999 for placement along approximately 150 linear feet for the purpose of protecting the existing bridges that will be demolished pursuant to

CDP 1-07-013 shall not cause undue erosion of the Mad River Corridor if it weathers out, fails, or causes end effects and further require that if evidence of any of this emerges, Caltrans will be responsible for processing an amendment to remove the RSP and restore the natural river bank (Special Condition 18: Future Debris Exposure Due to River Scour or Erosion); to require that the conversion of prime agricultural lands is mitigated to the degree possible through a \$2 million endowment fund for the College of the Redwoods agricultural education program focused on support for the college's Shively Education Center sustainable agricultural program (teaching farm) (Special Condition 19: Agricultural Mitigation); and to provide for the protection of marine mammals that may otherwise be affected by the hydroacoustic impacts of pile-driving (Special Condition 20: Marine Mammal Monitoring Program)

4.3.1.3 Conclusion

For all of the reasons set forth above, the Commission thus finds that the proposed project herein recommended for approval is an allowable use, that although the applicant--Caltrans--asserts that there is no feasible less environmentally damaging alternative to the subject proposed project that the Department of Transportation is willing to pursue, there is an alternative (See Alternative 8) above that would reduce the project's potentially significant adverse impacts on listed salmonids and other species by limiting the effects of pile-driving through revised plans and restricting pile-driving to a maximum of one section per day (Special Conditions 2 and 14); that feasible mitigation is required to minimize all significant adverse impacts associated with the implementation of the project as proposed by the applicant (see discussion of special conditions, above), and that coastal water quality will be protected against degradation as the result of the proposed project (see applicable special conditions protective of water quality, above), provided the project is constructed in full accordance with the approved project description, and in accordance with all standard and special conditions imposed by the Commission. Therefore, the Commission finds that the proposed project, if implemented in full compliance with the standard and special conditions set forth above, and as conditioned as discussed in this section of the Commission's findings and other pertinent sections by reference, will be consistent with the applicable sections of the Coastal Act.

4.3.2 GEOLOGIC STABILITY; HAZARDS

4.3.2.1 Standard of Review: Applicable Coastal Act Policies and Standards

The Coastal Act contains policies to assure that new development provides structural integrity, minimizes risks to life and property in areas of high geologic, flood, and fire hazard, and does not create or contribute to erosion. Section 30253 of the Coastal Act states in pertinent part that:

New development shall:

- (1) Minimize risks to life and property in areas of high geologic, flood, and fire hazard.
- (2) Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs.

4.3.2.2 Analysis

The applicant proposes to construct two new bridges on the west side of the U.S. Highway 101 crossing of the Mad River, north of Arcata and south of McKinleyville, in unincorporated Humboldt County. As part of the proposed project, the applicant would demolish the existing two-bridge crossing of the river. The applicant acknowledges that the project is located in an area of high geologic hazard, and states that the "purpose and need" for the replacement of the existing bridges is to address a) scour activity in the river that has exposed the footings of bridge piers in the water and b) to provide seismic improvements.

Seismic Hazards

The applicant prepared and certified a Negative Declaration (California Environmental Quality Act) dated June 17, 2005, which contains sections summarizing the project (page 1), explaining the project's "purpose and need" (page 2) and evaluating the hazard/geology/floodplain context of the proposed project (page 25) (Exhibit A). Pertinent excerpts from the subject environmental document state:

"SUMMARY

...The bridges are structurally deficient and do not meet current scour (pier footing erosion), seismic or geometric (e.g., road curve, lane width, vertical clearance) guidelines. The proposed project is designed to correct these deficiencies."

"III. PURPOSE AND NEED

"...The north and southbound Mad River Bridges are structurally deficient and are at the end of their useful life. River flows have scoured the pier footings exposing and undermining the bridge foundations. Additionally, the bridges do not meet current seismic guidelines. Lastly, lane and shoulder widths on both bridges, on- and off-ramp acceleration and deceleration lengths and Route 200 intersection geometrics are substandard and do not meet current design guidelines..."

"F. GEOLOGY/FLOODPLAIN

"Setting. The Mad River Bridges are located within the vicinity of the Cascadia Subduction Zone (CSZ) and two local faults, the McKinleyville and Mad River/S (State of California, Department of Transportation, California Seismic Hazard Map 1995 and the State of California, Division of Mines and Geology, Fault Activity Map of California and Adjacent Areas). The two faults are located 0.4 km (0.25 mile) and 2.4 (1.5 mile) respectively north of the site and both can produce a credible maximum earthquake of 6.75 with a peak acceleration of 0.07g (sic). The CSZ is located approximately 70 km (43.5) miles west of the site and can produce a credible earthquake of 8.5 with a peak acceleration of 0.02g (sic). No faults are located within the project limits as delineated on the most recent Alquist Priolo Earthquake Zoning Map issued by the State Geologist."

"Design Features and Project Effects. The proposed bridges will be designed to withstand the maximum credible seismic event for the project location. The bridges are sized and designed so as to not impede or redirect flood flows. Structural foundation design features could include deepened piles that can accommodate extra loads from liquefied soils, pile isolation systems that isolate piles from liquefiable soils or soil densification. Abutments and associated rock slope protection are located above ordinary high water and will not impede or direct flood flows. The bridge replacement will not expose people or property to geologic or seismic hazards. Public safety will be improved because the new bridges will be constructed to better withstand seismic, scour and flood events."

While performing preliminary, pre-application review of the proposed project at Caltrans' request in April 2006, Commission staff reviewed information prepared by the Commission's staff geologist for a proposed PG&E facility at Humboldt Bay Power Plant, which is located about 20 miles southwest of the Mad River bridges. The pertinent staff report, dated September 15, 2005 for the Commission's September 2005 hearing, noted that the power plant could be affected by a Cascadia Subduction Zone earthquake of a magnitude of 9.0 or greater.^{11, 12} The Commission staff report stated (E-05-001, PG&E, Agenda Item Th6a, September 15, 2005):

"..(the proposed project).. is near the southern end of the Cascadia Subduction Zone and near a location known as the "Mendocino Triple Junction" where three crustal plates converge – the Pacific Plate to the south; the Gorda Plate and its extension, the Juan de Fuca Plate to the north; and, the North American Plate to the east. This area has been subject to very large earthquakes of a magnitude of about 9.0 that occur roughly every

¹¹ An earthquake's magnitude is a measurement of energy released by an earthquake, as expressed on a logarithmic scale measuring the horizontal displacement caused by an earthquake and detected on a seismograph. A magnitude 6 earthquake, for example, produces ten times the amount of ground shaking as a magnitude 5 earthquake.

¹² Staff report dated September 15, 2005 for Agenda Item Th6a, September 2005 Coastal Commission hearing, Eureka, for CDP Application No. E-05-001 (PG&E, Humboldt Bay Power Plant).

300 to 400 years and usually result in large tsunamis. The last such earthquake occurred in 1700.¹³

In light of the PG&E report, Commission staff requested in April 2006 that Caltrans confirm that the proposed Mad River bridges are designed to withstand a Cascadia Subduction Zone earthquake of M 9.0. Caltrans staff replied that:

"The Mad River Bridge will be designed to the parameters of a maximum credible earthquake."¹⁴

Caltrans additionally submitted the following information in November 2007:¹⁵

"The Maximum Credible Earthquake (MCE) Moment Magnitude as the Department of Transportation currently uses in conjunction with Caltrans Seismic Hazard Map 1996 (CSHM 1996), is defined as the "largest earthquake reasonably capable of occurring based on current geological knowledge."

A moment magnitude is used to measure the energy released during an earthquake. As the energy travels through earth, the intensity of shaking generally decreases. The CSHM 1996 displays the estimated shaking as Peak Horizontal Bedrock Acceleration (PHBA) with contours.

In order to provide seismic design recommendations for Caltrans structures, the causative fault is identified (i.e. fault name, moment magnitude, and style of faulting). Depending on where the structure is located, the PHBA is estimated by consulting the aforementioned map. For example, a fault with an MCE of moment magnitude of 7.5 could create a PBHA of 0.72g at a distance of 1 kilometer from the bridge, while the very same fault could generate an estimated PBHA of 0.34g at a distance of 15 kilometers from the source.

In case of Mad River Bridge No. 04-0025 RL, the controlling seismic source is identified to be Mad River fault with an MCE of moment magnitude of 6.75. The estimated PBHA is 0.7g.

The Cascadia Subduction Zone with an MCE of moment magnitude of 8.5 is about 70 kilometers south west of the bridge site, and does not control the ground motions at the site."

Caltrans additionally submitted the following information in further response to questions posed by Commission staff, on December 3, 2007:¹⁶

¹³ The subject project site addressed by the staff report is located approximately 20 miles southwest of the proposed Mad River Bridges replacement project site.

¹⁴ Source: E-mail message to Commission staff from Richard Mullen, Caltrans Project Manager for Mad River Bridges replacement project, dated April 10, 2006.

¹⁵ Source: E-mail message to Commission staff from Richard Mullen, Caltrans, dated November 19, 2007.

¹⁶ The document, titled "Mad River Bridges Seismic Design Criteria Summary" was submitted to Commission staff by attachment to an e-mail message sent by Richard Mullen, Caltrans, December 3,

**"MAD RIVER BRIDGES
SEISMIC DESIGN CRITERIA
SUMMARY"**

"It is CalTrans' policy to design our structures to meet a "No Collapse" performance standard under the Maximum Credible Event (MCE). The MCE is defined as largest earthquake reasonably capable of occurring at the bridge site and is based on current geological knowledge. It is determined by the moment magnitude of the fault, the site's distance from the fault, and type of fault. Since most bridge sites have more than one fault that could cause a seismic event, the fault that produces the most severe ground motion (Peak Bedrock Horizontal Acceleration - PBHA) is the governing, or controlling fault."

"In the case of the Mad River Bridge (04-0025R/L), the controlling fault is the Mad River/C fault with a moment magnitude of 6.75. It is 1.5 kilometers from the bridge site and could potentially produce a maximum PBHA of 0.7g. While the Cascadia Subduction Zone has a larger moment magnitude (8.5) than the Mad River/C fault, it is 70 kilometers distant from the bridge site and produces a lower maximum PBHA. As a result, it is not the controlling fault."

The additional information submitted by Caltrans clarified typographical errors contained in the Mitigated Negative Declaration certified by Caltrans in 2005: In the MND, as cited above, the Peak Bedrock Horizontal Acceleration – PBHA – is stated as 0.07 g, but the more recent Caltrans information cited immediately above states the PBHA as 0.70 g. As discussed further below, more recent Caltrans information also clarifies that PHBA for a Cascadia Subduction Zone earthquake would be .2 g not 0.02 g.

In a conference call on December 11, 2007 that included the North Coast District Manager and Caltrans staff from District 1 and headquarters, including Caltrans geotechnical expert staff and bridge engineers, Commission staff requested that Caltrans consider the PG&E geologic studies that examined the risks associated with a Cascadia Subduction Zone earthquake and verify that the Mad River Bridges have been designed to withstand such risk. Caltrans requested that Commission staff provide the PG&E studies that the Commission staff geologist relied on in reviewing the PG&E CDP application No. E-05-001. The Commission staff geologist provided the requested information on December 13 and the information was forwarded to Caltrans on December 14, 2007.

On December 18, 2007, Caltrans responded:¹⁷

“Mad River Seismic Issues:

1. The estimated Peak Horizontal Bedrock Acceleration (PHBA) is 0.7g as reported in the July 18, 2001 Preliminary Seismic Design Recommendations provided by the Office of Geotechnical Earthquake Engineering. Please note that a value of 0.07g was inadvertently used in the Negative Declaration and Initial Study and is incorrect.
2. An issue was raised as to why Caltrans used a PHBA of 0.7g, while PG&E used 2.9g for the Humboldt Bay Power Plant (HBPP). Below is what is noted in the report entitled “Geotechnical Review Memorandum” dated August 12, 2005 by Mr. Mark Johnssons, Staff Geologist of California Coastal Commission.
 - Paragraph 1 on page 6 of the memorandum discusses the peak Spectral Acceleration (SA) of 2.9g corresponding to a period of 0.25 second. The reported SA is very unique to the methodology, site characteristics, fault parameters and distance to fault.
3. Based on Caltrans Seismic Hazard Map 1996, a Maximum Credible Earthquake of Moment Magnitude of 8.5 was assigned to Cascadia Subduction Zone Fault. In PG&E report, the same fault has been given a mean characteristic magnitude range of 8.5 to 9.1.
4. PG&E based its seismic hazard on a synchronous rupture of Little Salmon Fault and the Cascadia Subduction Zone Fault with modification to attenuation relations. However, based on the methodology used by Caltrans, the controlling fault for the design of Mad River Bridge is the Mad River/C fault. The distance of from the Mad River/C fault to bridge is estimated to be about 1.5 kilometers. The distance to Cascadia Subduction Zone fault from the Mad River Bridge (MRB) is about 70 kilometers.
5. Due to critical nature and life span of the PG&E project a return period of 2000 years was selected for design analysis. While Caltrans’ bridges are typically designed for a life span of less than 100 years with return periods of much less than 2000 years.”

“Summary:

“The Peak Horizontal Bedrock Acceleration (PHBA) used for the MRB is 0.7 g.”

¹⁷ Submitted as an unsigned attachment dated December 18, 2007 to an e-mail message sent by Richard Mullen, Caltrans, to Commission staff on December 18, 2007.

"The Spectral Acceleration (SA) used at the Humboldt Bay Power Plant (HBPP) has a peak of 2.9 g corresponding to a structural period of 0.25 sec and is based on a 2000-year return period. This is not the same as PHBA. Instead, PHBA is the acceleration at the bedrock/soil interface and is not a function of the soil horizons or characteristics of the structure being investigated."

"The peak SA used by PG&E is based upon an analysis that is a function of the specific location of the HBPP, the ground conditions from the bedrock to the ground surface, the return period, the specific location of the facility relative to local faults and the structural characteristics of the facility. All of these are different for the Mad River Bridge location. Consequently, it is not meaningful to compare the two sets of numbers, as each is unique to the locations, site, structural characteristics, design life, and seismic criteria."

"It should be noted that the peak spectral acceleration is not necessarily the most significant attribute for the structure since the spectral acceleration that applies is determined by specific structural characteristics and may be lower than the peak."

"Regarding the magnitude earthquake of the Cascadia Subduction Zone Fault. The value used by Caltrans for this fault was based on the current state of practice and is consistent with data shown in the PG&E report. The critical nature of a nuclear power plant facility leads to incorporating significantly more conservative design philosophy. The impact of structural failure of such facilities is far more significant than bridge failure among the general public. Therefore, the use of an MCE of 9.1 by PG&E was based on seismic criteria specific to the HBPP project and are different than the MRB."

Commission staff also requested on December 18, 2007 that Caltrans staff identify the author of the above citations and the author's credentials, and correct the apparent error concerning the Peak Horizontal Bed Acceleration for a CSZ earthquake that was made in the geology section of Caltrans' Mitigated Negative Declaration (see excerpts above).

Caltrans geotechnical expert Reza Mahallati replied on behalf of Caltrans in an e-mail message to Commission staff on December 18, 2007:

"I am the Senior Seismic Specialist for the Office of Geotechnical Design North who is responsible for providing seismic recommendations for all the projects within the Caltrans Districts 01, 02, 03, 05, 06, 09, and 10. I received a Master Degree in Geotechnical Engineering from the University of New Orleans. I have been directly involved with geotechnical seismic design recommendations and procedures for the last 12 years, ten of which has been as a senior engineer."

"We have just reviewed the 2005 Negative Declaration, page 25. I believe the attenuation relationship that is part of the Caltrans Seismic Hazard Map documentation was used to estimate the peak horizontal bed rock acceleration (PHBA) for the Cascadia Subduction Zone (CSZ) Fault of magnitude 8.5 at a distance of about 70 kilometers from the bridge site. The estimated PHBA was calculated to be 0.2g and should not be 0.02g as reported in the environmental document, i.e. the 0.02 g shown in the Negative

Declaration is a typographical error. PHBA values are based upon several factors. Among the factors, distance from the fault, is very significant. With the CSZ at an approximate distance of 70 km the PHBA is significantly reduced from the Mad River/C fault, which generates a PHBA of 0.7 g from a distance of about 1.5 km.”

“I hope this clarifies the questions you indicated below.”

Thus, Caltrans has provided corrections to the typographical errors in the geology section of the Mitigated Negative Declaration of June 2005 and has also verified that the design of the proposed Mad River Bridges was prepared with full consideration of the accurate and complete information available regarding the extent of seismic risks posed to the bridges by a Cascadia Subduction Zone earthquake.

The Commission relies on these representations of Caltrans staff who are qualified geotechnical engineers and bridge design experts, and have assured that the subject project will be safe from seismic hazards, including the statements of Caltrans senior seismic specialist and engineering geologist to verify that the proposed Mad River bridges will minimize risks to life and property in areas of high geologic risk, as required by Coastal Act Section 30253.

Coastal Erosion Hazards.

As stated above, Caltrans asserts that a primary component of the “purpose and need” associated with the proposed project is to address scour that has occurred in the Mad River channel in the past, and which has exposed the concrete footings of the bridge piers.

Caltrans provided the following additional information at the request of Commission staff, which includes some “constructability analysis” in addition to the geotechnical information, prepared by Matt Brady, Assistant District Director of Caltrans District 1, and a licensed professional engineer: ¹⁸

“The design of the new Mad River Bridges is controlled by local pier scour induced by the 100-year flood, not by degradation induced by upstream mining operations. In 2004, as part of their biennial inspection of the Mad River Bridge and after investigating and inspecting the bridge while taking measurements of the channel, Caltrans Structure Maintenance and Investigations engineers prepared their latest channel cross-section of the Mad River at the bridge crossing location. The cross sections, which Caltrans has been preparing since 1957, indicate that local bridge scour is still occurring due to the characteristics of the river and the underlying geology at the crossing location regardless of gravel extraction.

¹⁸ Source: attachment to email message sent to Commission staff by Gary Berrigan, Caltrans lead environmental analyst for the Mad River Bridges project, dated November 6, 2007.

The bridge inspection report (the document used to scope and program the replacement project) rated the existing Mad River Bridges as a "3" on a scour scale from 9 to 0. "9" is a bridge on dry land and "0" is a bridge that has collapsed from scour. As defined by Caltrans using Federal Highway Administration (FHWA) criteria, a "3" is described as "bridge is scour critical; bridge foundations determined to be unstable for assessed or calculated scour conditions:

- Scour within limits of footing or piles
- Scour below spread-footing base or pile tips"

Following FHWA methods for calculating future anticipated scour at bridges, which is controlled by the anticipated 100-year flood, the local pier scour elevation was determined to occur in the order of 15 feet below the thalweg (low spot) of the river. The local pier scour elevation defines the elevation as to what depth scour can be anticipated to occur from the 100-year flood. If a pile cap were used, as would be required with the use of 30-inch diameter piles, additional excavation of material would be required within the cofferdam to construct the pile cap below the scour elevation. Approximately 47 feet of excavation would be required at Pier 2, approximately 36 feet at Pier 3 and approximately 41 feet at Pier 4 since the original ground where each of the piers is to be constructed is at a higher elevation than the low spot of the river. The depths of excavation take into account the thickness of the footing and seal course (see below for a more detailed explanation), which are placed below the scour elevation line. With a 7-foot diameter pile alternative, approximately 30 feet of excavation at Pier 2, 10 feet at Pier 3 and 20 feet at Pier 4 will still occur below original ground but only to a depth to what is termed the pile cut-off elevation. The bridge design engineer through detailed analysis establishes the pile cut-off elevation. The pile cut-off elevation establishes the location where the support shaft transitions from a pile to a pier with this monolithic piling to pier design. Also, since a footing is not required with the 7-foot diameter pile option, the cofferdam size will be much smaller resulting in less volume of excavation.

A pile cap, also known as a bridge footing, would encroach significantly into the wetted channel of the river with a portion (approximately 40) of the piles being required to be driven in the wetted channel. As the bridge spans are already designed at their maximum lengths for a cast-in-place prestressed box girder bridge, it would not be possible to lengthen the spans to avoid the footing from intruding into the wetted channel. A footing would be approximately 25-feet in length, or 12.5 feet either side of the piers, which would cause the concrete footing at Pier 3 to intrude into the wetted channel by approximately 5 feet at the northerly side of the footing.

For comparison, the Southbound Route 101 Van Duzen River Bridge in Humboldt County was designed using 30-inch diameter piles for the piers. Approximately 36 piles were designed to be used at each pier on the Southbound Van Duzen River Bridge that was recently constructed. The pile cap, or reinforced concrete footing, for each of the piers was approximately 6 feet thick with an additional 4-foot thick concrete seal course, used to deter water from intruding into the cofferdam during construction of the footing. A footing is required to transfer load from the piers into the pilings. Each of these reinforced concrete footings were 30 feet by 30 feet in size. In order for the footings to

be below the calculated scour elevation, the following approximate depths of excavation were required at the Southbound Route 101 Van Duzen River Bridge:

Pier 2 39 feet
Pier 3 39 feet
Pier 4 51 feet

Caltrans Bridge Design Engineers and Geotechnical Engineers designed the Mad River Bridges using 7-foot diameter pilings instead of 30-inch diameter pilings for the following reasons:

- Monolithic piling-to-pier construction for scour and seismic demands for the site; specifically, for structural design superiority related to the analysis and design of the foundation
- 7-foot diameter pilings are located out of the wetted channel, where they would not be exposed to continued scour potential from lower intensity storms and flows; if a footing were used as required for the 30-inch diameter piling, the pilings in the wetted channel would be exposed to this lower intensity scour potential
- Has a smaller footprint to construct as 30-inch diameter piling requires a reinforced concrete footing that would have to be excavated to at approximately 36 feet below the current riverbed elevation at Piers 3 and 4
- Would avoid having cofferdam located in the wetted channel
- Would require less time to construct as there are approximately 20 times less piles and no footing would have to be constructed"

Thus, Caltrans has demonstrated that specific conditions within the immediate area of the Mad River channel may affect the proposed bridge foundations in a manner that requires that the new bridges be constructed with a footings-free pier system, as Caltrans has proposed. Caltrans states that if the bridges are constructed with the proposed pier design, it will be safe from scour and erosion and will not require the placement of any form of revetment within the channel, along the river banks, or around the proposed new piers.

Coastal Flooding.

Caltrans certified a Negative Declaration for the subject project on environmental document for the subject project on June 17, 2005. The document states in pertinent part (page 25) that:

"...The area up and downstream of the bridges is currently mapped and designated as a 100-year floodplain by the Federal Emergency Management Agency (FEMA). The new bridges will not increase the 100-year water surface elevation, and therefore, there will be no impact to the base floodplain."

"Design Features and Project Effects. The bridges are sized and located so as to not impede or redirect flood flows.... Abutments and associated rock slope protection are

located above ordinary high water and will not impede or redirect flood flows... Public safety will be improved because the new bridges will be constructed to better withstand... flood events.

Maps published by the Humboldt State University geology department for information purposes only show that the location of the Mad River Bridges is subject to moderate tsunami risk. Caltrans staff has acknowledged the risk and note that the engineering geologists and design engineers on the project design team considered this risk along with the applicable seismic risks when designing the proposed new bridges.

Assumption of Risk

As stated above, Caltrans acknowledges that the proposed bridge location is subject to potential seismic risks, which may include liquefaction, and that the bridge location could be subject to tsunami hazards as well. Further, the location of the bridge renders it subject to the additional natural hazards posed by storms, floods, and erosion, as is true of any bridge located over a river that drains a substantial watershed and is additionally subject to tidal influence due to the bridge's proximity to the Pacific Ocean.

Caltrans has performed geotechnical testing of the Mad River Bridge area and represents that the proposed bridge is designed to withstand the predictable hazards associated with its location to the extent feasible. Nevertheless, it is not possible to remove all associated risk associated with the uncertainties of natural hazards. Residual risks remain.

For these reasons, the Commission finds that even though Caltrans has mitigated predictable risks by engineering the proposed bridge to withstand the associated forces, a degree of risk from natural or human-induced hazards will remain and cannot be fully mitigated. To protect the Commission and its employees from liability for the hazards posed by the subject structures and project features designed and managed by Caltrans, the Commission requires Special Condition 17 (Assumption of Risk).

4.3.2.3 Conclusion: Coastal Act Consistency

Therefore, for all of the reasons set forth above, the Commission finds that the proposed project, as confirmed safe by the Caltrans engineering geologist and bridge designer, as conditioned, is consistent with the pertinent requirements of Coastal Act Section 30253.

4.3.3 PUBLIC COASTAL ACCESS & RECREATION

4.3.3.1 Standard of Review: Applicable Coastal Act Policies and Standards

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

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

Section 30212.

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

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

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

Section 30213. Lower cost visitor and recreational facilities shall be protected, encouraged, and, where feasible, provided. . . .

Section 30214.

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

- (1) Topographic and geologic site characteristics.
- (2) The capacity of the site to sustain use and at what level of intensity.
- (3) The appropriateness of limiting public access to the right to pass and repass depending on such factors as the fragility of the natural resources in the area and the proximity of the access area to adjacent residential uses.

(4) The need to provide for the management of access areas so as to protect the privacy of adjacent property owners and to protect the aesthetic values of the area by providing for the collection of litter.

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

4.3.3.2 Analysis: Coastal Act Consistency

Caltrans proposes to replace the existing bridges that carry highway traffic across the Mad River on Highway 101 for safety reasons, as stated above. The bridges have outlived their design lives, are structurally and seismically deficient, and are being undermined by scour of the riverbed that has lowered the stream channel beneath the bridges as much as fifteen feet in one area, since 1929. All alternatives to the project considered by Caltrans include replacing the bridges with new, wider bridges that incorporate current safety standards. Only the "no project" alternative would preserve the existing bridges. However, if the bridges are left in place, one or both will eventually fail.

The Highway 101 Bridge over the Mad River is approximately two miles inland from the ocean, but is the first, or western-most, road crossing of river. In addition, the next crossing of the river is approximately two miles further upstream from the Highway 101 Bridge. Thus, failure of the Highway 101 Bridge would severely impede the ability of the public to access the coast on opposite sides of the river. In addition, this portion of Highway 101 is classified as a Principal Arterial on the National Highway System. This segment of highway serves interregional and interstate traffic and provides the key transportation gateway for local residents and visitors traveling to a wide variety of coastal access and recreation destinations along the northern California coast. Coastal access opportunities would be severely compromised if the bridge replacements did not occur and the bridges were allowed to fail.

In addition to protecting the integrity of the highway link provided by the bridges, the proposed project would include significant public coastal access amenities. The Coastal Trail is not located within the proposed project site, but this section of Highway 101 is designated as the Pacific Coast Bike Route. The widened shoulders and separate pedestrian pathway proposed on the new bridges would significantly enhance safety for bicyclists using the Pacific Coast Bike Route, and would provide a safe, traffic-separated pedestrian crossing of the bridges for the first time.

Caltrans proposes to construct a pedestrian crossing on the east side of the northbound bridge (see conceptual illustration in Exhibit C). The crossing would be eight feet wide

and would be tied to landing areas at each end of the bridge. Caltrans proposes to complete the pedestrian walkway, and to install the guard rail separating pedestrians from the paved shoulder and traffic lanes, outer pedestrian rails, and other safety features, by the end of the construction period. Caltrans staff confirmed on the request that Caltrans proposes to construct the bridge corridor in a manner that will be fully compliant with the requirements of the Americans with Disabilities Act. Caltrans states that the ADA requires that the pedestrian corridor on the bridge be a minimum of five feet in width, to accommodate wheelchair access. Caltrans also confirmed on request that Caltrans will open the pedestrian corridor to the public by the end of the construction period and that the corridor would remain open permanently. Special Condition 13 (Protection of Future Public Access) incorporates permanent protection of the public access assured by Caltrans.

The pedestrian corridor would not only provide a safe pedestrian link between the outskirts of Arcata and McKinleyville, via the river crossing, but would also give pedestrians significant separation and protection from traffic. These features would make it possible for people walking across the bridge to enjoy the eastward views of the Mad River corridor. Aesthetic issues associated with the final design of the rails and other features are discussed in the visual resources section below.

The southbound (coastal side) Mad River Bridge will not have a pedestrian corridor. The proposed bridges will increase the paved width of the bridge crossing significantly, and Caltrans determined that it was not feasible to put the pedestrian corridor on the west side of the crossing or to incorporate a crossing on each side of the corridor due to ingress and egress issues that would have required, among other things, acquisition of additional lands from property owners. Caltrans determined that the landings at each end of the bridge could be better accommodated within Caltrans' existing right of way (the bridge alignment is shifting to the west).

Special Condition 13 requires Caltrans to permanently protect and provide permanent public access for pedestrians and non-motorized vehicles on the proposed pedestrian crossing on the eastward side of the northbound Mad River Bridge crossing. The condition also requires Caltrans to permanently provide access to the 10-ft.-wide paved shoulders on the bridge decks for access by bicyclists. The Commission finds that Special Condition 13 will ensure that public coastal access amenities included in the applicant's proposal will be provided consistent with the pertinent policies and provisions of Chapter 3 of the Coastal Act.

4.3.3.2 Conclusion: Coastal Act Consistency

The Commission finds that as the proposed bridge replacement project, as conditioned, will (a) maintain a critical crossing of the Mad River for providing coastal access to the coastline in the local area, (b) maintain an essential link in the Pacific Coast Bike Route and the key interregional and interstate highway serving the North Coast that provides bicycle and vehicular coastal access to the coastline in the broader region, (c) include a separated pedestrian walkway that will provide safe pedestrian access across the

bridge for the first time, and (d) greatly improve safety for bicyclists that use the bridge, and thus that the proposed project, as conditioned, is consistent with the Chapter 3 policies of the Coastal Act concerning public coastal access and recreation.

4.3.4 VISUAL RESOURCES

4.3.4.1 Standard of Review: Applicable Coastal Act Policies

Section 30251.

The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas. New development in highly scenic areas such as those designated in the California Coastline Preservation and Recreation Plan prepared by the Department of Parks and Recreation and by local government shall be subordinate to the character of its setting.

Section 30253 states in pertinent part:

New development shall:

(2) Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs.

(5) Where appropriate, protect special communities and neighborhoods which, because of their unique characteristics, are popular visitor destination points for recreational uses.

4.3.4.2 Analysis

The proposed bridge replacement will remove the unmatched pair of aging bridges and replace them with a unified design for bridge rails and other features. The new bridges will have a significantly wider total area of bridge and ramp deck (an increase of 32,831 square feet of surface area compared with the existing bridges), and will make it more difficult for drivers to gaze directly down onto the river and its banks. However, the new northbound bridge will have an 8-foot-wide pedestrian corridor that will for the first time offer safe crossing to pedestrians who could enjoy the eastward river views from the bridge deck.

Temporary visual resource impacts will occur during construction due to cut and fill earthwork, vegetation removal, and the presence of equipment in the construction and staging areas. These impacts would be adverse in the short-term, but long term restoration will occur through re-planting with locally native plant materials and stock (except where agricultural operations otherwise occur, and these will be planted in accordance with the property owner's agricultural use) as required by Special Condition 8 (Landscape and Erosion Control).

In addition, the large billboard in the pasture immediately west of the southbound bridge will be permanently removed to make room for the new bridges, and Caltrans has purchased the development rights to the billboard. Caltrans and Humboldt County staff have evaluated whether a replacement billboard could be installed by any surrounding agriculturally-zoned property owners and have determined that billboards are not an authorized use on agricultural lands. Therefore, the removal of the billboard will be a permanent benefit to the visual resources of the project setting.

Caltrans has not proposed final designs for bridge rail, lighting, and signage features, but has agreed to remove architectural lighting that was initially proposed along the walkway. This will reduce the potential light pollution of the night sky, and minimize the illumination of habitat areas near the bridge. Caltrans added a request on December 7, 2007 for unspecified night lighting during the project construction. Such lighting may create adverse visual impacts by illuminating the coastal night sky, but more importantly may adversely affect the riparian corridor habitat which is also a wildlife migration corridor, over the five or more years of anticipated project construction. Special Condition 14 calls for revised plans to eliminate night lighting, and to eliminate architectural lighting on the bridge that exceeds the minimum necessary for highway safety. Special Condition 14 also calls for elimination of the 8-foot-high "picket" style outer rails on the multi-modal corridor on the eastward-most edge of the northbound bridge and replacement with the lowest ST-10 plus bike rail consistent with bicycle safety.

4.3.4.3 Conclusion: Coastal Act Consistency

The Commission finds that as the proposed bridge replacement project as conditioned will (a) utilize a rail design that maximizes views through the railing; (b) replant construction areas with native plants; (c) permanently remove a billboard; and (d) minimize the illumination of habitat areas and the night sky, the proposed project, as conditioned, is consistent with the Chapter 3 policies of the Coastal Act concerning visual resources.

4.3.5 CONVERSION OF AGRICULTURAL LANDS

4.3.5.1 Standard of review: Coastal Act Policies

Section 30241:

The maximum amount of prime agricultural land shall be maintained in agricultural production to assure the protection of the area's agricultural economy, and conflicts shall be minimized between agricultural and urban land uses through all of the following:

- (a) By establishing stable boundaries separating urban and rural areas, including, where necessary, clearly defined buffer areas to minimize conflicts between agricultural and urban land uses.
- (b) By limiting conversions of agricultural lands around the periphery of urban areas to the lands where the viability of existing agricultural use is already severely limited by conflicts with urban uses or where the conversion of the lands would complete a logical and viable neighborhood and contribute to the establishment of a stable limit to urban development.
- (c) By permitting the conversion of agricultural land surrounded by urban uses where the conversion of the land would be consistent with Section 30250.
- (d) By developing available lands not suited for agriculture prior to the conversion of agricultural lands.
- (e) By assuring that public service and facility expansions and nonagricultural development do not impair agricultural viability, either through increased assessment costs or degraded air and water quality.
- (f) By assuring that all divisions of prime agricultural lands, except those conversions approved pursuant to subdivision (b), and all development adjacent to prime agricultural lands shall not diminish the productivity of such prime agricultural lands.

Section 30242:

All other lands suitable for agricultural use shall not be converted to nonagricultural uses unless:

- (1) continued or renewed agricultural use is not feasible, or
- (2) such conversion would preserve prime agricultural land or concentrate development consistent with Section 30250. Any such permitted conversion shall be compatible with continued agricultural use on surrounding lands.

The Coastal Act defines "prime agricultural land" as land that meets one or more of the following, as referenced in paragraphs (1) through (4) of Section 51201(c) of the California Government Code:

- (1) a rating as class I or class II in the Natural Resource Conservation Service land use capability classifications;
- (2) a rating 80 through 100 in the Storie Index Rating; or
- (3) the ability to support livestock used for the production of food and fiber with an annual carrying capacity equivalent to at least one animal unit per acre as defined by the United States Department of Agriculture; or
- (4) the ability to normally yield in a commercial bearing period on an annual basis not less than two hundred dollars (\$200) per acre of unprocessed

agricultural plant production of fruit- or nut-bearing trees, vines, bushes or crops which have a nonbearing period of less than five years.

In addition, Coastal Act Section 30250 requires consideration of the cumulative impacts of development (defined in Coastal Act Section 30105.5) as follows:

"Cumulatively" or "cumulative effect" means the incremental effects of an individual project shall be reviewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.

In addition, Coastal Act Section 30250 states in pertinent part:

(a) New residential, commercial, or industrial development, except as otherwise provided in this division, shall be located within, contiguous with, or in close proximity to, existing developed areas able to accommodate it or, where such areas are not able to accommodate it, in other areas with adequate public services and where it will not have significant adverse effects, either individually or cumulatively, on coastal resources.

4.3.5.2 Analysis

Caltrans proposes to construct two new bridges to carry traffic on U.S. Highway 101 over the Mad River, at the crossing north of Arcata and south of McKinleyville, in rural, unincorporated Humboldt County (see Exhibit AA). The new bridges would be constructed on the west side of the existing two-bridge crossing of the highway, and would be significantly wider than the existing bridges. The area freed up by the eventual demolition of the old bridges, which is also proposed by Caltrans, would not be returned to agricultural use. The site of the proposed project is surrounded on all sides by large parcels of prime agricultural lands, and the landscape is one of scenic, expansive coastal vistas and pasturelands dotted with farmhouses and barns. Most of the adjacent and nearby pasturelands are used to graze beef or dairy cattle, or horses, or to produce hay. The terraces of the Mad River contain some of the most productive soils in the county, according to the Humboldt County general plan background documents.

Permanent conversion of prime agricultural lands

According to Caltrans, the overall construction footprint of the proposed project includes an area of about twenty (20) acres in size. Of this total area, 3.58 acres of prime agricultural lands would be permanently converted to highway use. Caltrans proposes mitigation for the loss of these prime agricultural lands, as discussed below.

Riparian mitigation on non-prime agricultural lands

In addition, and as further discussed below, Caltrans proposes to plant at least 5.4 acres of an off-site forty-acre parcel bordering the south side of Old Samoa Road, near Arcata, with riparian trees such as willow and alder, as partial compensatory mitigation

for the proposed project's significant adverse impacts on riparian wetlands adjacent to the Mad River. That parcel is a wetland pastureland that is presently grazed by cattle, and cattle grazing would continue as a management practice by California Department of Fish and Game.

Temporary impacts to prime agricultural lands

Some temporary and possibly significant adverse impacts on agricultural productivity would result from temporary conversion of additional prime agricultural lands during construction. Large areas of pasturelands that adjoin the north and south sides of the proposed project site will be required during some or all of the five-year construction cycle for access, materials storage, staging, construction, de-watering, and related activities. Livestock would be excluded from the affected areas during project activities, and forage production within these areas would not be possible until the project is completed. The affected lands could be up to fifteen acres in size, and production would be limited to varying degrees for approximately five (5) years.

The affected areas would be fully returned to pre-existing agricultural use after the project is completed, without long-term reduction in productivity or conversion of the subject lands to non-agricultural use. The impacts associated with the temporary loss of agricultural use of the lands would be an economic loss to the County's agricultural economy. Caltrans states that the affected property owners will be financially compensated for the agricultural income lost during construction, thus mitigating the short-term adverse impact on the County's agricultural economy from diminished production revenues that will result from the proposed project.

Prime agricultural lands

As stated by the Coastal Act policies set forth above, the maximum amount of prime land shall be maintained in agricultural production to assure the protection of the County's agricultural economy. The definition of "prime agricultural lands" is also set forth above.

The linkage between prime land production and local agricultural economy is directly stated in the first clause of Section 30241: "the maximum amount of Prime agricultural land shall be maintained in agricultural production . . . to assure the protection of the area's agricultural economy." This precept reflects the fact that the productivity of prime land is a key economic factor in the overall agricultural viability of Humboldt County.

Caltrans has determined that the subject lands are considered prime agricultural land pursuant to the Coastal Act definition set forth above. The "Mad River Bridges Replacement Project, US Route 101, Negative Declaration and Initial Study" dated June 2005, prepared & certified by Caltrans, states on page 17:

"... The soils within the project limits include Prime agricultural soils, identified in the Soils of Western Humboldt County, California, November 1965. Soils in the project

vicinity are mapped as Ferndale 2 with a very small portion mapped as Ferndale 13. The Ferndale series are generally characterized as having medium texture, well-draining soils of recent alluvial origin. The Ferndale 2 soils have a high nutrient capacity and a favorable moisture holding capacity. The soils are rated 100 in the Storie Index, which is categorized as prime agricultural soils. The Ferndale 13 soils are located along the banks of the river and are of mixed textural composition. Most of these areas are subject to frequent annual flooding and the soil material ranges from deep to shallow, normally hummocky or channeled. This soil type is separate from riverwash because of the agricultural potential where flooding can be controlled. The Storie Index rates this soil as Variable."

Therefore the Commission concludes that Caltrans has accurately identified the lands in question as prime agricultural land as defined by the Coastal Act.

Impacts of Conversion of Prime Agricultural Lands

Prime agricultural lands are the "engine" of a healthy agricultural economy and typically offer the most return on farming or ranching investment. As noted below in an article written by a Humboldt County farmer in April 2007, one acre of high quality bottomland pasture in Humboldt County, for example (which may not even have soils or other measures that qualify as "prime") is worth 20 acres of rangeland in the hills. An acre of agricultural land with prime soils is potentially more productive than any other kind of open field agricultural property in Humboldt County – particularly if irrigation is feasible.

The project proposed by Caltrans requires the permanent conversion of 3.58 acres of lands with prime soils in the Mad River floodplain. Humboldt County planning documents indicate that the lands in the Mad River flood plain contain some of the richest soils in the County. The lands are located along strips of the highway footprint and are needed to realign the highway toward the west when the Highway 101 bridges over the Mad River are replaced. The lands that would be converted are actively grazed by cattle, or farmed for forage, or both. Seasonal irrigation is feasible on these lands, and has been observed in operation on the parcels on the northern end of the crossing, on both sides of the highway during site visits and Commission field trips over the past two years.

The "Negative Declaration" prepared by Caltrans in 2005 and cited above states on page 16:

"...US Census of Agriculture (1997) information indicates approximately 650,000 acres, or more than 25 percent of the total acreage in Humboldt County, was in agricultural use (excluding timber) in 1982. The county has experienced the loss of 3,000 to 5,000 acres of farmlands annually since 1964 due to conversion to non-agricultural uses.

Based on this information only, Humboldt County may have lost between 99,000 – 165,000 acres of agricultural land in the 33 years from 1964 to 1997. Put another way, by 1997 Humboldt County may have lost as much as 65,000 acres of agricultural lands – or as much as ten (10) percent of the agricultural lands that were in production only 13 years earlier. Considered still another way, the rates of agricultural land conversion in Humboldt County, as disclosed by the US Census of Agriculture data quoted by Caltrans in the “Negative Declaration” suggest that, if agricultural land conversions persisted at the higher range of the rate of conversion, Humboldt County may have lost as much as 50,000 additional acres of agricultural land just in the last ten years.

Considered in yet another way, as projected from the 5,000 acre/year rate of loss at the upper end of the range identified by Caltrans in the 2005 “Negative Declaration” – by 2007 Humboldt County may have lost as much as 215,000 acres of agricultural land since 1964. Of the 650,000 acres of agricultural land that Humboldt County claimed back then, fully one-third of these lands may already have been converted to other uses.

The “Negative Declaration” of June 2007 further states (page 16):

“...Dairy farming and milk production is the largest industry in Humboldt County, with nursery, livestock, and field crop production following. Humboldt County dairies produce about one percent of the state’s total supply of milk. California is ranked number 1 for milk production in the United States.”

As noted above, the “Negative Declaration” established that Humboldt County has been losing as much as 5,000 acres of farm land *per year* since 1964. While a simple reading of these numbers might indicate that the loss of an acre or two of agricultural land here or there is insignificant, the trend toward conversion of agricultural lands is clearly significant and can best be explained by the cumulative losses of agricultural lands that are in finite supply and subject to increasing demand for conversion to residential and other use.

The “Agricultural Resources Report” prepared in August, 2003 by Humboldt County Department of Community Development Services as part of the Humboldt County General Plan Update, notes that of the applications for subdivisions processed by the County since 1985, 29% (152 applications) have occurred in an agricultural resource zone.

Humboldt County organic farmer John LaBoyteaux, writing on April 10, 2007 in the “Farmer’s Almanac” of the Eureka Times-Standard (www.times-standard.com), discussed his view on the adverse impacts of cumulative losses of agricultural land in Humboldt County at a time when agricultural enterprises appear to be experiencing new vitality and need more agricultural resources. The article points out that bottom-land pasture, such as the agricultural land affected by the development, is particularly valuable as an

acre of bottom-land pasture, including reclaimed tidelands, has a livestock carrying capacity equal to 20 or more acres of rangeland in the hills. The article indicates that Mr. LaBoyteaux has farmed in the Eel River Canyon since 1980, served five years on the Humboldt County Resource Conservation District, served as president of the Humboldt County Farm Bureau from 2004-2006, and currently chairs the County Williamson Act Advisory Committee:

... approximately one-third of the feed required by our dairy industry must be imported to Humboldt County. There is simply not enough available cropland to raise the needed feeds for this industry (\$42.5 million gross sales in 2005).

An acre of bottom-land pasture, including reclaimed tidelands, has a livestock carrying capacity equal to 20 or more acres of rangeland in the hills. (Carrying capacity is generally the number of cattle or cow/calf pairs that can be sustained on pasture or rangeland with little or no supplemental feeding.) Our beef and livestock industry (\$24 million gross sales in 2005) shares and sometimes competes for the same lands used for dairy or crop production.

Humboldt County's agriculture Industry supports and depends upon an infrastructure of support services, including material suppliers, equipment dealers, transportation providers, processors and marketers. The contribution of these businesses to the economy of Humboldt County and the employment of Humboldt County families is not reflected in the \$326 gross sales of agricultural products.

Humboldt County agriculture is much more, and it's expanding. Nursery production has moved ahead of dairy in gross sales. At the same time, there is a resurgence of dairy production through conversion to organic practices, which provides considerably greater return per unit of milk for the dairymen.

The Humboldt Creamery now sells premium organic ice cream nationally. Cattle ranchers delivering to new local brands such as Humboldt Grassfed and Eel River Organic are developing specialty markets for Humboldt beef. Cypress Grove Chevre distributes Humboldt Fog and other cheeses to every state in the country. Local produce is sold through 15 growing farmers markets throughout the county and retail outlets like Northcoast Coop, Eureka Natural Foods, Murphy's Markets, Ray's Markets and various smaller stores and restaurants.

About a dozen row-crop farmers export produce to regional markets in San Francisco and the Sacramento Valley. The Community Alliance with Family Farmers is linking local farms with schools and institutions to improve the quality of foods our children eat in school.

Unfortunately, a decreasing land base threatens the future of local small farms like mine and every other type of agriculture in Humboldt County. The Humboldt County General Plan Update, Agricultural Resources Report is quoted below.

The article points out that there is a tension between the trend in growth of the County's beef and dairy industries, due to competition for the finite supply of the pasture and

forage lands to supply feed and pastureland forage. Humboldt County is now a net importer of hay needed to sustain the base of its agricultural economy.

The Humboldt County "Agricultural Resources Report" cited above states (p. 1-3)

"... The highly productive delta soils of the Mad River and the Eel River, north and south of Humboldt Bay respectively, provide the basis for significant agricultural resources....These regions can be characterized as prime agricultural soil, flood plains, deep loam soils ranging in sand and clay content... The cities of Arcata...and the unincorporated area of McKinleyville, are all located on prime agricultural soil. Proximity to market and soil quality spotlight all these regions as prime for small market farms, but land prices are high."

The report further notes that issues associated with the agricultural lands near McKinleyville (the subject site is located just south of the southernmost limits of the unincorporated McKinleyville area, outside of the urban/rural boundary) include:

"...Grazing diminished with the expansion of housing and mini-ranches. Protection of AE (Agriculture Exclusive) lands supports the opportunity for specialty ag enterprise and the steady growth of organic blueberries and nursery farms."

Thus, the Commission concludes that agricultural grazing or forage production lands in areas of prime soils (the subject properties are prime agricultural lands), where irrigation is feasible (the subject properties are seasonally irrigated) have very high value for the dairy and beef industries.

The proposed project would permanently convert 3.58 acres of these lands, with prime soils, to a non-agricultural use for the realigned highway and bridges. As noted by the local farmer/author in the article cited above, these lands may have an equivalent value to almost 70 acres of upland rangelands. For every acre of grazing or pastureland lost, the local dairy and beef industries must import more hay from distant sources. As energy prices increase, the cost of transporting tons of hay from distant producers will rise. The share of feed costs represented by the transportation component will continue to rise. Local pasturelands suitable for forage production are in declining supply due to increased pressure for conversion to subdivisions and other land uses. Thus, the value per acre of local grazing and pasturelands will inevitably rise.

The Commission also finds, for the reasons discussed above, that the lands that would be permanently converted by the proposed project contain prime soils considered to be among the most productive in Humboldt County. The article excerpted above (LaBoyteaux 2007) noted that there is more demand for productive land among the small farmers in the County than the available supply can support. Moreover, the long term trends documented since 1964 clearly show that whether by conversion of small acreages or division of large ranches, a strong trend toward the cumulative loss of agricultural land exists in the County and may begin to limit the prospects for expansion of the agricultural economy.

Thus, the 3.58 acres that would be permanently converted to highway use if the project is constructed in the manner that is presently proposed by Caltrans are significant coastal agricultural resources. Further, for all of these reasons stated above, the Commission finds the permanent loss of the subject 3.58 acres of prime agricultural land that will occur if the project is constructed as proposed is significant and adverse both on an individual impact and a cumulative impact basis, within the meaning of the provisions of Section 30250(a) and 30241 cited above.

Additional conversion of non-prime agricultural lands proposed for mitigation of riparian impacts.

Prior to publication of the previous staff report for this project in June 2007, Caltrans acquired an approximately 40-acre parcel located on Old Samoa Road, within the City of Arcata, for the purpose of undertaking approximately 2 acres of riparian wetland mitigation. This mitigation was proposed as additional compensatory mitigation for temporal and performance losses associated with restoration of riparian wetlands on the proposed project site.

Caltrans previously proposed to perform mitigation on site at the Mad River Bridges location at a 1:1 ratio, and to provide off-site the additional 3:1 mitigation advised by the Commission staff ecologist as necessary to secure an overall 4:1 wetland mitigation ratio deemed necessary to mitigate the loss of high quality, mature riparian canopy that the proposed project would remove from the banks of the Mad River and project environs.

The Commission staff ecologist reviewed the previous proposal and concurred that planting up to two acres of riparian species along the street edge of the property would provide cover and habitat for some species, and would also provide a buffer from disturbance for the remainder of the parcel, which would still be subject to cattle grazing as a management practice when the land transferred ultimately to the management oversight of the California Department of Fish and Game (in conjunction with the McDaniels Slough Restoration project), as Caltrans proposed and as CDFG agreed.

However, in the most recent information submitted by Caltrans in support of the proposed application (November 2007), Caltrans disclosed that a revised delineation of the wetlands impacted by the proposed project showed that an additional two (2) acres of riparian/wetlands would be affected by the proposed project. Caltrans indicated that there was no location on the project site that would afford the underlying 1:1 mitigation on site mitigation that Caltrans had previously proposed as a combination of on – and off- site mitigation of riparian impacts that would result from project construction.

Caltrans now proposes, in light of the revised delineation, to undertake riparian wetland mitigation on two acres of the Old Samoa parcel as previously proposed and to undertake an additional 3.4 acres of wetland mitigation at Old Samoa for a total of about 5.4 acres of wetland mitigation at that site. This would raise the total acreage of existing grazed wetland pasturelands at Old Samoa that would be converted to willow and willow-associate species plantings impermissibly and cause a conversion of agricultural

lands that would be inconsistent with Coastal Act Section 30242, as discussed below. Although the Old Samoa parcel is not prime agricultural land, this amount of conversion would be significant, and is avoidable. Caltrans could perform the necessary additional riparian wetland mitigation that will be required elsewhere.

Coastal Act Section 30242 protects lands suitable for agricultural use that are not prime agricultural lands or agricultural lands on the periphery of urban areas from conversion to non-agricultural use unless continued agricultural use is not feasible, or such conversion would preserve prime agricultural land or concentrate development consistent with Section 30250. In the case of the Old Samoa parcel, cattle grazing (though limited by seasonal inundation and general pasture quality) has been the primary use of the subject site for decades, and would likely continue. Bottomland pastures are considered relatively nutritious compared to upland pastures. Caltrans delineated the parcel as nearly 100% wetlands and alternative development options appear to be severely constrained. Thus, continued agricultural use appears to be feasible, and conversion of the land to non-agricultural use under Caltrans' proposal for riparian mitigation would not preserve prime agricultural land or concentrate development, which the Coastal Act prescribes as the basis for allowing conversion. For these reasons, the proposed conversion of agricultural lands at the Old Samoa parcel would not be consistent with the requirements of Coastal Act Section 30242.

The Commission notes that the Commission staff ecologist continues to support the planting of up to two (2) acres of the forty-acre Old Samoa parcel with riparian species along the boundaries of the parcel with Old Samoa Boulevard (Highway 255). This planting represents an appropriate management of the site consistent with historic vegetation patterns that show fringe patterns of willow and willow-associate species along the margins of such habitat, as the Commission found in approving CDP 1-06-036 in June 2006 (City of Arcata – McDaniels Slough restoration). In addition, the planting of up to two acres of the parcel with willows, alder, and other compatible riparian species will provide a buffer from the road and provide habitat continuity that will render the site attractive to the CDFG for combined management with the adjacent McDaniels Slough complex. CDFG indicates that continued seasonal grazing will be allowed as part of the overall management plan, and thus the parcel will remain in agricultural use. Additionally, the riparian plantings and management of the site by CDFG will attract Aleutian Goose by providing a more protected sheltered area for the geese during their seasonal migrations to the area. Creating an attractive seasonal grazing area for the Aleutian Goose will benefit nearby livestock enterprises by reducing goose grazing impacts on other pasturelands during the seasonal migration period. Therefore, the planting of two acres of riparian vegetation around the fringe of the property serves an agricultural purpose and does not represent a conversion of agricultural land.

The Commission finds, however, that planting additional acreage with riparian vegetation at locations other than the perimeter of the parcel serving as a buffer from the road would not only have little or marginal benefit for attracting more geese but would displace grazing area that would no longer be available for livestock grazing.

Therefore, planting more riparian vegetation on the site for habitat mitigation purposes than the two acres of riparian vegetation originally proposed to be planted on the margins of the site would represent a conversion of agricultural land inconsistent with Section 30242 of the Coastal Act. Therefore, Special Condition No. 15 requires submittal of a revised wetland mitigation plan that would limit the planting of riparian vegetation at the De Mello site to only two acres along the fringe of the parcel.

Alternatives considered for potential reduction in conversion of agricultural lands

Caltrans has evaluated a range of alternatives for the highway project, as discussed in more detail elsewhere in this report, including various alternative alignments.

To understand the options for reducing agricultural conversion, it is important to note that the project setting is rural, and that the proposed project is surrounded by agricultural properties. The project traverses large agricultural parcels owned by a single owner on the north side of the Mad River and a single owner on the south side of the Mad River.

Shifting the alignment of the new bridges from the proposed location (immediately west of the existing highway bridges) over to the east side of the existing bridges would only shift the footprint of the project to other agricultural lands, including a working dairy with a historic farmhouse/barn complex and prime agricultural soils. In addition, an easterly alignment would not satisfy the safety (geometrics) requirements of the proposed project, which is sited as proposed in part to secure a safer alignment of on- and off-ramps associated with the highway context of the proposed project.

Caltrans also considered re-using the existing highway footprint through a technique called "half-width construction." This is a common method of installing a new bridge or highway section where space is highly constrained. If Caltrans deployed half-width construction in the footprint of the existing bridges, the overall conversion of agricultural lands would be reduced by the approximate area occupied by the existing bridges.

Half-width construction utilizes traffic control to shift through-traffic to one side of the bridge/highway while the other side is demolished and re-built for the new project. Then traffic is shifted to the new side and work proceeds on the remainder of the footprint. As discussed in this report, Caltrans considered the alternative of half-width construction for the proposed project but determined that one-way traffic could not operate safely during the four- to five-year construction schedule. Highway 101 in the subject area is a heavily traveled main corridor – a lifeline highway – for Humboldt County and the entire North Coast region. Thus Caltrans determined that the volume of traffic that would be backed up in delay, or re-routed to detour routes that are not designed to handle this volume and type of traffic (such as commercial trucks) over a period of years, could result in significant safety problems, so the alternative was rejected.

Commission staff also requested that Caltrans evaluate the option of constructing only one bridge, instead of a two-bridge crossing, thus eliminating the area of land in between the two bridges (and potentially reducing the area bridge piers within the stream bed and banks). Caltrans responded that the problems would be similar to those encountered during half-width construction because the bridge construction would be staggered between new bridge construction, demolition of one direction of the old bridges, new construction, etc., in alternating waves designed to limit interference with traffic and to improve construction safety.

To accomplish either half-width construction, or construction of a new bridge on one foundation (instead of two replacement bridges) Caltrans determined that either option would require closing one bridge at a time and necking traffic lanes down to one lane in each direction during construction. The Caltrans traffic analysis determined that these alternatives would back up traffic for miles at times, and would likely lead to a significant increase in stop-and-go or rear-end collision accidents. In addition, Caltrans considered that drivers seeking alternative routes either on their own or due to implementation of designated detour routes would, in an effort to avoid delays, overwhelm other surface streets that were not designed to carry the increased volumes of traffic, displacing traffic hazards to other locations that might become even more dangerous.

Based on this comprehensive analysis, Caltrans concluded that traffic delays and increased accident risks (when considered over the four- or five-year construction period Caltrans believes will be necessary to complete construction) would be unsafe and therefore infeasible. Therefore, these alternatives were dropped by Caltrans before environmental review of the surviving alternatives commenced (and therefore these alternatives are not discussed in the Mitigated Negative Declaration prepared and certified by Caltrans, June 15, 2005).

Caltrans also considered returning a portion of the lands within the footprint of the existing highway corridor in the project area to agricultural use after demolition and removal of the bridges and roadbed at the time the "Negative Declaration" was published in 2005. Since then Caltrans has determined that the better use of the right-of-way property would be for wetland mitigation on site. In addition, Caltrans has determined that aerially-deposited lead could compromise some areas of the site immediately adjacent to the existing highway footprint, rendering those locations less than ideal for return to agricultural use. Caltrans does not propose a widespread lead remediation project for these lands, but will remediate the locations specifically proposed for wetland mitigation use. Therefore, Caltrans has additionally considered and rejected this alternative that would reduce the net loss of agricultural lands on the subject site because it is not a less environmentally damaging feasible alternative to the proposed project. As a result, the project will permanently convert 3.58 acres of prime agricultural land to highway use without any on-site offsets.

Caltrans developed a range of other potential alternatives, but all required that the highway footprint be realigned outside of the existing highway corridor and onto

adjacent agricultural lands, either on the east or west side of the existing corridor. This is so in part because the right-of-way containing the highway footprint in this section of Highway 101 is relatively narrow.

Proposed Mitigation

Full mitigation for the conversion of prime agricultural lands is not possible. At best, partial mitigation may be accomplished—and significant benefits to the agricultural economy may accrue from such efforts -- particularly through the purchase or other means of preservation of agricultural lands threatened by “on-the-ground” development pressure to convert such lands to other uses. Examples of such lands would be parcels zoned or used for agriculture – or suitable for return to such use – but demonstrably pressed for conversion to other developed uses by (for example) the recent extension of services such as sewer or water, nearby conversions to other uses, etc.

Caltrans initially proposed to mitigate the loss of the prime agricultural lands that would result from the construction of the project as proposed, through payment of a set fee per acre into a public fund for the benefit of agriculture. Caltrans proposed that the amount paid would be the equivalent assessed value of the lands taken, on a per-acre basis. At the time Caltrans certified its Negative Declaration for the proposed project (June 2005), no per-acre amount had been fixed. By July of 2007, however, Caltrans determined that the approximate amount per acre would be set at about \$10,000. On that basis, Caltrans proposed to mitigate the loss of 3.58 acres of prime agricultural lands by paying the \$10,000/acre equivalent – or \$35,800 – into a public fund for the general benefit of agriculture.

Commission staff considered the Caltrans proposal but determined that the true cost of attempting even partial mitigation for the loss of prime agricultural lands in Humboldt County, within the general area of the proposed project (between Eureka and McKinleyville, generally, within the coastal zone), as measured by the goal of recovering lands that would otherwise likely be converted to non-agricultural use (that is, lands that had non-agricultural development rights) was considerably higher than \$10,000 per acre. As explained in more detail below, staff determined that the cost-per-acre of recovering such threatened lands that were either prime agricultural lands with development rights, or lands that could be farmed as the equivalent of prime agricultural land through amendment and management practices, would cost closer to \$100,000 per acre, plus the costs associated with agricultural management/stewardship (costs would be higher for parcels being returned to agricultural use or converted to enhanced agricultural use).

Since paying a modest in-lieu fee was clearly unlikely to yield even a reasonable level of compensatory agricultural mitigation, staff provided guidance to Caltrans that a specific mitigation property should be identified and purchased for this purpose, and in

accordance with the general parameters noted above for identifying suitable properties that could yield agricultural mitigation benefits.

Caltrans thereafter identified a parcel that met the guidance offered by Commission staff. The parcel was a 2.8-acre parcel of land zoned and used for agricultural grazing and forage production but which had recently been identified for extension of water and sewer services and was being actively marketed through a real estate company as being "suitable for estate development." The parcel was located immediately adjacent to the coastal zone boundary, within the City of Arcata limits and adjacent to the City's existing sustainable organic agriculture teaching farm (Arcata Educational Farm), operating as a Community Supported Agriculture (CSA) teaching farm by Humboldt State University staff and students. The site was accessible by a nearby public school via a potential trail that would have allowed students to walk to the farm for visits without crossing any roadways. The existing farm was about two acres in size and the potential mitigation parcel was enough land to more than double the size of the teaching farm, but fit right into the existing stewardship structure. The combination of these factors and the proportionally small size of the potential acquisition seemed like a good overall match for Caltrans' agricultural mitigation needs for the Mad River project.

Caltrans proposed to purchase the property in May 2007 to provide the majority of the mitigation needed for the Mad River Bridges project, and staff prepared a report favorably recommending the project for the June 2007 Commission hearing, partly on the basis of the quality of the agricultural mitigation proposed by Caltrans.

Within days after the staff report was published for the June 2007 hearing, however, Caltrans received disappointing news from the real estate company representing the property owner that the Caltrans purchase offer could not be presented to the owner because another purchase offer had already been accepted for the property. This left the issue of agricultural mitigation unresolved.

Search for alternative agricultural mitigation

The effort to evaluate and secure the Old Arcata Road parcel was not wasted, however. Caltrans staff developed a greater awareness of the assessment of mitigation potential in specific properties, and developed a list of candidate parcels. The price of true candidate parcels with significant non-agricultural development rights became clearer. Instead of \$10,000 per acre (the 2007 general price of acquiring a parcel of agricultural land without development rights for conversion to non-agricultural use, and typically as part of the purchase of a much larger agricultural holding), the price of lands that constituted agricultural mitigation in the pertinent area of Humboldt County appeared to be more like \$100,000 per acre. The search effort for a new mitigation property underscored the value of quality mitigation parcels, and disclosed the comparative rarity of parcels that met a variety of considerations to qualify for agricultural mitigation. In the approximately three months following June 2007, no specific parcel emerged that had all of the qualities and opportunities for successful stewardship that were offered by the Old Arcata Road parcel.

A New Agricultural Mitigation Proposal

In August 2007, however, the Caltrans project manager notified Commission staff of a new agricultural mitigation opportunity that had come to the attention of Caltrans:

The College of the Redwoods, the local community college, owns a 38-acre "sustainable organic agriculture farm" sometimes referred to as the Shively Farm. The farm was bequeathed to the college in 1995, with the condition that the farm be used for agricultural education. If the college failed to use the farm for this purpose, the donor's will specified that the college would forfeit the land to the Save the Redwoods League, and the land would be planted with redwoods and maintained as a park. (see articles published by the North Coast Journal, Exhibits 2 and 3, and Exhibits DD and EE)

According to Caltrans, the college had nonetheless tried to sell the farm to raise money for the school soon after the college received the land, and a protracted legal battle ensued. The lawsuits were resolved, and the college learned that it could not dispose of the land in any other way than to abandon it to the Save the Redwoods League.

Since the courts had determined that College of the Redwoods had to use the land as an agricultural educational facility -- or lose it -- the college hired a farm manager and was investing in the improvements the farm needed to be a sustainable organic teaching farm.

However, the College had financial problems sustaining the farm. The funds that had been bequeathed with the land (approximately \$200,000) had been used up, college enrollments had declined overall, agricultural teaching faculty had retired, and on the whole -- the agricultural program was under consideration for closure. That would mean that the 38-acre Shively Farm would be permanently converted to a non-agricultural use, and the College's agricultural education program might never recover its former strength.

Given the peril faced by the Shively Farm's funding status and the waning agricultural program at College of the Redwoods, Caltrans proposed that funding the substantial preservation of the Shively Farm through College of the Redwoods be considered as mitigation for conversion of agricultural lands associated with the development of the Mad River Bridge project. Providing funding to maintain the College of the Redwoods Shively Farm program would prevent the agricultural lands from being converted to a non-agricultural use.

The Executive Director and Commission staff, the Caltrans District 1 Executive staff, the Mad River Bridges project team, and College of the Redwoods administrators immediately met to consider the possibilities. From that collaborative effort, a new agricultural mitigation initiative --- to be fully funded by Caltrans -- emerged.

The new agricultural mitigation proposal contains three key overall features:

1. Endowment of a permanent, full-time agricultural education program faculty position, with an emphasis on filling the position with a candidate well qualified to develop agriculture programs at the College of the Redwoods, and to revitalize and maximize the use of the Shively Farm as a key teaching resource laboratory. In addition to the primary mission of teaching College of the Redwoods agricultural program students, the College's agricultural education program, under the leadership of the selected faculty member whose salary would be funded by the endowment, would include community agricultural outreach and education programs to enhance the skills and success of local agriculturalists, and to educate community members interested in these programs.
2. Improvement of the Shively Farm, focusing on replacing or providing new critical infrastructure support for the farm. Such improvements must be considered essential to enhancing the agricultural education function of the farm and the overall productivity of the farm within that context.
3. Provision of enhanced transportation from the college campus in Eureka to the Shively Farm (an approximately 45-minute drive, one way). Currently, students provide their own transportation at considerable personal expense and inconvenience. Consistent with the goal of reducing greenhouse gases, the program would allow the College to purchase at first one, and then as enrollment increases, two, "green" vans – hybrid high mileage versions – for this purpose. The van(s) would be exclusively dedicated for the agricultural education program's use.

As the mitigation proposal would result in saving approximately 38 acres of prime agricultural land, many times more acreage than the acreage that will be converted by development of the Mad River Bridge project, Caltrans proposes that the mitigation proposal also serve as mitigation for two additional future Caltrans projects within the coastal zone of District 1 that would result in the conversion of agricultural land. The two projects include (1) the Alton Interchange project on Highway 101 and Highway 36, near Fortuna in unincorporated Humboldt County, where up to 42 acres of prime agricultural land would be converted, and the Klamath Grade Raise project near the Klamath River in unincorporated Del Norte County, where up to 2 acres of agricultural lands would be converted to highway improvements. Coastal development permit applications have not yet been filed as complete for these two projects and neither project has been scheduled for a Commission hearing.

To achieve the three key components of the revitalized College of the Redwoods agricultural education program, Caltrans proposes to fully fund a \$2 million payment to the College of the Redwoods Foundation for this purpose. The funds would be payable prior to commencement of construction of development authorized by CDP application No. 1-07-013, and would not be refundable if for any reason the other two Caltrans

projects for which Caltrans hopes to secure future mitigation consideration by the Commission from the \$2 million payment do not progress.

The payment would not be refundable in whole or in part because without the critical mass of the total funding, no sub-component would be adequate to facilitate the College's ability to hold onto the Shively Farm and to revitalize the agricultural education program sufficiently to secure increased enrollment and thus maintain the farm for the long run. Caltrans staff indicate that they understand and have ensured that as an agency Caltrans understands and accepts the risk that if, for any reason, the Commission does not approve the other two projects "in the pipeline," the \$2 million would be paid solely toward the mitigation obligation of Caltrans for the agricultural impacts of the Mad River Bridges project alone (3.58 acres of prime agricultural land).

Caltrans determined that the agency could pay \$2 million directly to the College of the Redwoods Foundation for management and distribution in accordance with the proposal discussed herein. The College verified that no administrative costs would be required by the Foundation – every dollar of \$1.5 million of the total funded by Caltrans, plus all interest earned on that money, would go toward the endowment of the agricultural education program permanent faculty position; \$0.5 million of the total funded by Caltrans, plus all interest earned on that money, would go toward the essential infrastructure needs of the Shively Farm and up to two hybrid, high-mileage vans for the transport of students from the college to the farm.

The Caltrans proposal to endow the agricultural education program at the College of the Redwoods in a manner that is focused on re-vitalizing the Shively Education Center (Shively Farm) provides additional benefits to the broader community of the north coast as well. The College's program would protect and enhance the agricultural teaching function of the Shively Farm; the permanent teaching position would anchor faculty continuity and long term planning of the educational program to maximize the use of the Shively Farm and to provide outreach to the community in matters of agricultural sustainability.

4.3.5.3 Conclusion: Coastal Act Consistency

Even with the proposed mitigation, the conversion of agricultural lands resulting from the development is inconsistent with Coastal Act Sections 30241 & 30242.

The proposed bridge and highway development will permanently convert 3.58 acres of prime agricultural land. Section 30241 limits the conversion of prime agricultural lands and requires that conflicts between urban and agricultural land uses be minimized through all of the following:

- (a) Establish stable boundaries separating urban and rural areas, including, where necessary, clearly defined buffer areas to minimize conflicts between agricultural and urban land uses;

- (b) Limit conversions of agricultural lands around the periphery of urban areas to the lands where the viability of existing agricultural use is already severely limited by conflicts with urban uses or where the conversion of the lands would complete a logical and viable neighborhood and contribute to the establishment of a stable limit to urban development;
- (c) Permit the conversion of agricultural land surrounded by urban uses only where the conversion of the land would be located within, contiguous with, or in close proximity to, existing developed areas able to accommodate it or, where such areas are not able to accommodate it, in other areas with adequate public services and where it will not have significant adverse effects, either individually or cumulatively, on coastal resources;
- (d) Develop available lands not suited for agriculture prior to the conversion of agricultural lands;
- (e) Assure that public service and facility expansions and nonagricultural development do not impair agricultural viability, either through increased assessment costs or degraded air and water quality; and
- (f) Assure that all divisions of prime agricultural lands, except those conversions approved pursuant to subdivision (b), and all development adjacent to prime agricultural lands does not diminish the productivity of such prime agricultural lands.

The Commission finds that the conversion of grazing lands to the proposed highway improvements is inconsistent with the above criteria on Section 30241 for minimizing conflicts between urban and agricultural use for several reasons. First, the conversion of grazing land would not occur in an area that is either surrounded by urban uses or on the periphery of an urban area as required by criteria (b) and (c) above. To the contrary, the bridge and highway development would be performed in the middle of an agricultural area, surrounded on all sides by lands locally zoned for agricultural use and used as agricultural grazing lands. The nearby communities of McKinleyville and Arcata are separated from the project site by the agricultural lands that surround the development site. Second, the conversion of agricultural lands resulting from the development would not establish a stable boundary separating urban and rural areas and provide a clearly defined buffer between potentially incompatible uses as required by criteria (a) above. As previously discussed, the bridge and highway development does not separate any urban areas from agricultural areas. Instead, the development merely divides existing agricultural areas from each other. Finally, the development does not develop lands unsuited for agriculture use prior to the conversion of agricultural lands, as affected grazing lands are currently in agricultural use.

As discussed previously, the applicant also proposes to mitigate impacts to riparian habitat in part, by planting a total of 5.4 acres of riparian vegetation on a 40-acre agricultural parcel. Although two acres of the proposed riparian plantings would be planted along the margins of the parcel and would facilitate agricultural use for reasons explained previously, 3.4 of the acres would result in the direct conversion of agricultural lands for a non-agricultural use. The 40-acre parcel does not contain prime agricultural lands but is subject to Section 30242 of the Coastal Act which requires that all lands suitable for agricultural use that are not prime lands or lands along the periphery of urban areas unless continued agricultural use is not feasible or such conversion would preserve prime agricultural land or concentrate development consistent with Section 30250 of the Coastal Act. As continued use of the 40-acre parcel for agricultural grazing is feasible and is planned by CDFG, and as the mitigation proposal for the site would not concentrate development in any form, the proposed conversion of 3.4 acres of the site from agricultural use to riparian habitat is not consistent with Section 30242. Moreover, it is feasible to mitigate impacts to riparian habitat elsewhere without impermissibly converting agricultural land. Therefore, Special Condition No. 15 requires submittal of a revised wetland mitigation plan that would limit the planting of riparian vegetation at the De Mello site to only two acres along the fringe of the parcel.

However, as discussed further in the following section of this report, although the project proposes to impermissibly convert 3.58 acres of agricultural lands with prime soils, the project ensures and enhances continued public access and recreation along the highway at this essential crossing of the Mad River and to the coastal regions beyond. The eventual failure of the existing bridges that Caltrans states will inevitably occur if the existing bridges are not replaced would severely impede public coastal access and recreation, in conflict with the policies of the Coastal Act protective of these public coastal resources.

4.3.6 RESOLVING POLICY CONFLICTS

4.3.6.1 Standard of Review: Coastal Act

Coastal Act Section 30007.5 states:

The Legislature further finds and recognizes that conflicts may occur between one or more policies of the division. The Legislature therefore declares that in carrying out the provisions of this division such conflicts be resolved in a manner which on balance is the most protective of significant coastal resources. In this context, the Legislature declares that broader policies which, for example, serve to concentrate development in close proximity to urban and employment centers may be more protective, overall, than specific wildlife habitat and other similar resource policies.

Coastal Act Section 30200(b) states:

Where the commission or any local government in implementing the provisions of this division identifies a conflict between the policies of this chapter, Section 30007.5 shall be utilized to resolve the conflict and the resolution of such conflicts shall be supported by appropriate findings setting forth the basis for the resolution of identified policy conflicts.

4.3.6.2 Analysis

As noted previously in this report, the proposed project is inconsistent with pertinent provisions of Sections 30241 and 30250 of the Coastal Act. However, as explained below, denying or modifying the proposed project to eliminate these inconsistencies would lead to nonconformity to other Coastal Act policies, namely policies protective of public coastal access and recreation.

Regarding its inconsistency with Section 30241, even though the new Mad River Bridges replacement proposed location is the most suitable of the feasible and available sites for reducing operational hazards of existing traffic and for reducing seismic and scour risks that have affected, or may affect the existing, aging pair of bridges presently in use for the highway crossing of the river, approving the construction of the new bridges at the proposed location would not be fully consistent with the requirements of Sections 30241 and 30250 to preserve the maximum amount of prime agricultural land and to avoid cumulatively adverse impacts of development on coastal resources. The proposed location of the new bridges would require the permanent conversion of 3.58 acres of prime agricultural lands with highly productive soils to non-agricultural use for highway purposes.

However, denying the proposed Mad River Bridges replacement project on the basis of these inconsistencies would result in the continued presence of the existing bridges, which Caltrans has determined to be substandard and unsafe due to scour in the river channel that has exposed some bridge footings to risk of further erosion and instability according to Caltrans, and also due to the seismically substandard design of the existing, aging bridges. If a bridge collapse were to occur, safe and effective public access to the coast, and particularly to areas of coastal recreation, including areas that offer lower cost visitor services and recreational opportunities, would be cut off for a significant period of time. This would significantly affect public coastal access and recreation opportunities on the entire north coast as the Highway 101 is a primary "lifeline" link for north coast transportation and to almost all coastal access and recreation destinations north of the proposed bridges location. In such a situation, when a proposed project is inconsistent with a Chapter 3 policy, and denial or modification of the project would be inconsistent with another policy, Section 30007.5 of the Coastal Act provides for resolution of such a policy conflict.

Applying Section 30007.5

As indicated previously, the standard of review for the Commission's decision on a coastal development permit in the Commission's retained jurisdiction is whether the proposed project is consistent with the Chapter 3 policies of the Coastal Act. In general, a proposal must be consistent with all relevant policies in order to be approved. If a proposal is inconsistent with one or more policies, it must normally be denied or conditioned to make it consistent with all relevant policies.

However, the Legislature recognized through Sections 30007.5 and 30200(b) that conflicts can occur among those policies. It therefore declared that when the Commission identifies a conflict among the policies of Chapter 3, the conflict is to be resolved "in a manner which on balance is the most protective of significant coastal resources", pursuant to Coastal Act Section 30007.5.

That approach is generally referred to as the "balancing approach to conflict resolution." Balancing allows the Commission to approve proposals that conflict with one or more Chapter 3 policies, based on a conflict among the Chapter 3 policies as applied to the proposal before the Commission. Thus, the first step in invoking the balancing approach is to identify a conflict among the Chapter 3 policies.

1) The project, as proposed, is inconsistent with at least one Chapter 3 policy:

For the Commission to apply Section 30007.5, a proposed project must be inconsistent with an applicable Chapter 3 policy. In the case of this proposed project, the inconsistency is with Sections 30241 and 30250 as discussed previously.

2) The project, if denied or modified to eliminate the inconsistency, would affect coastal resources in a manner inconsistent with at least one other Chapter 3 policy that affirmatively requires protection or enhancement of those resources:

A true conflict between Chapter 3 policies results from a proposed project which is inconsistent with one or more policies, and for which denial or modification of the project would be inconsistent with at least one other Chapter 3 policy. Further, the policy inconsistency that would be caused by denial or modification must be with a policy that affirmatively mandates protection or enhancement of certain coastal resources. Denial of the proposed replacement of the Mad River Bridges on U.S. Highway 101 would be inconsistent with Section 30210 of the Coastal Act.

Section 30210, which requires, in part, that "maximum access shall be provided for all the people" (the Mad River Bridges are part of the key U.S. Highway 101 "lifeline" corridor of the north coast region and beyond and if the bridges fail, coastal recreation opportunities would be cut off for a substantial period of time while the

bridges are eventually rebuilt under emergency conditions). The Highway 101 Bridge over the Mad River is approximately two miles inland from the ocean, but is the first, or western-most, road crossing of river. In addition, the next crossing of the river is approximately two miles further upstream from the Highway 101 Bridge. Thus, failure of the Highway 101 Bridge would severely impede the ability of the public to access the coast on opposite sides of the river. In addition, this portion of Highway 101 is classified as a Principal Arterial on the National Highway System. This segment of highway serves interregional and interstate traffic and provides the key transportation gateway for local residents and visitors traveling to a wide variety of coastal access and recreation destinations along the northern California coast. Coastal access opportunities would be severely compromised if the bridge replacements did not occur and the bridges were allowed to fail.

In most cases, denying a proposed project will not cause adverse effects on coastal resources for which the Coastal Act mandates protection or enhancement, but will simply maintain the status quo. Where denial of a project would result in adverse effects, as would denial of this proposed highway bridges replacement project and its resulting disruption of public access, a conflict between or among two or more Coastal Act policies is presented.

3) The project, if approved, would be fully consistent with the policy that affirmatively mandates resource protection or enhancement:

For denial of a project to be inconsistent with a Chapter 3 policy, the proposed project would have to protect or enhance the resource values for which the applicable Coastal Act policy includes an affirmative mandate. That is, if denial of a project would conflict with an affirmatively mandated Coastal Act policy, approval of the project would have to conform to that policy. If the Commission were to interpret this conflict resolution provision otherwise, then any proposal, no matter how inconsistent with Chapter 3, that offered a slight incremental improvement over existing conditions could result in a conflict that would allow the use of Section 30007.5. The Commission concludes that the conflict resolution provisions were not intended to apply to such minor incremental improvements.

Because the proposed highway bridges are designed, according to Caltrans, to be safe for the "maximum credible earthquake" and to prevent future bridge collapse due to river scour, the proposed Mad River Bridges are designed, according to Caltrans, to protect against the collapse or other harm to highway users that may otherwise arise if the existing substandard bridges are not replaced. Thus, the project as proposed and conditioned, is therefore fully consistent with Coastal Act Sections 30210 as maximum access would continue to be provided to all the people.

4) The project, if approved, would result in tangible resource enhancement over existing conditions:

This aspect of the conflict between policies may be looked at from two perspectives – either approval of the project would result in improved conditions for a coastal resource subject to an affirmative mandate, or denial or modification of the project would result in continued degradation of that resource.

Approval of the proposed Mad River Bridges replacement project would result in replacement of two existing, aging, substandard bridges that Caltrans states are presently affected by scour in the river channel and inadequate protection against seismic risks. Caltrans asserts that if the bridges are not replaced, and replaced in the manner prescribed by Caltrans, one or both of the existing bridges will eventually collapse. If a bridge collapse were to occur, safe and effective public access to the coast, and particularly to areas of coastal recreation, including areas that offer lower cost visitor services and recreational opportunities, would be cut off for a significant period of time. This would significantly affect public coastal access and recreation opportunities on the entire north coast as the Highway 101 is a primary “lifeline” link for north coast transportation and to almost all coastal access and recreation destinations north of the proposed bridges location.

Denial of the proposed bridges project would result in the continued operation of the existing bridges and the continued higher risks associated with the responses of these bridges to the “maximum credible earthquake” that may affect the subject location according to Caltrans, as well as the continued higher risks associated with the reduced foundation strength that Caltrans asserts has resulted from the exposure of the concrete footings of the existing bridges due to scour in the river channel. The existing bridges are also subject to tsunamis (with or without earthquakes) and generalized flooding and erosion that may affect the Mad River channel due to tidal and storm conditions. But for the proposed project to replace the aging bridges with bridges designed to the safety standards that Caltrans asserts are contemporary for such bridges, the existing bridges would be expected to remain in service for the foreseeable future. During that time, it is possible that an earthquake with or without tsunami, a tsunami that may occur with or without an earthquake in the area, flooding or storm surges or a combination of these hazards, may affect the existing bridges. Any of these events would likely result in damage or destruction of the existing bridges in excess of the damage that would be expected to occur if the proposed new bridges were in place instead, according to Caltrans. Therefore, approval of the project would result in improved conditions for public access and denial would result in continued degradation of that resource.

5) The benefits of the project must result from the main purpose of the project, rather than from an ancillary component appended to the project to “create a conflict”:

A project’s benefits to coastal resources must be integral to the project purpose. If a project is inconsistent with a Chapter 3 policy, and the main elements of the project do not result in the cessation of ongoing degradation of a resource the Commission is

charged with enhancing, the project proponent cannot "create a conflict" by adding to the project an independent component to remedy the resource degradation. The benefits of a project must be inherent in the purpose of the project. If this provision were otherwise, project proponents could regularly "create conflicts" and then request that the Commission use Section 30007.5 to approve otherwise unapprovable projects. The balancing provisions of the Coastal Act could not have been intended to foster such an artificial and easily manipulated process, and were not designed to barter amenities in exchange for project approval.

The proposed Mad River Bridges replacement project is designed to be a more stable and to better withstand seismic hazards than the existing highway bridges at this river crossing. The project as proposed by Caltrans consists of structures designed to resist river scour and to withstand the forces of the "maximum credible earthquake" as defined by Caltrans for the subject project site. Therefore, the benefits to public access along the coast are integral to the project purpose.

6) There are no feasible alternatives that would achieve the objectives of the project without violating any Chapter 3 policies:

Finally, a project does not present a conflict among Chapter 3 policies if at least one feasible alternative would meet the project's objectives without violating any Chapter 3 policy. Thus, an alternatives analysis is a condition precedent to invocation of the balancing approach. If there are alternatives available that are consistent with all of the relevant Chapter 3 policies, then the proposed project does not create a true conflict among those policies.

As noted above, over the past two years Caltrans evaluated a variety of design general project alternatives to determine the best feasible location and design for the proposed Mad River Bridges replacement project. The analysis evaluated the "no project" and onsite alternatives. No offsite alternative was evaluated because the bridges must be constructed in a location proximate to the existing highway corridor and the bridges must tie in to the point of conformity north and south of the existing bridges within a reasonable distance from the footprint of the new bridges. The "no project" alternative would have Caltrans maintain and require the public to use the current, aging pair of substandard highway bridges that presently comprise the river crossing of Highway 101 at this location. While this system meets current minimum requirements according to Caltrans, and thus the existing bridges are not subject to being shutdown due to safety deficiencies, denial of the project proposed by Caltrans would result in continued operation of the existing bridges that, as noted above, are not designed and strengthened in accordance with contemporary safety and design standards that Caltrans now applies to such structures in locations subject to the natural hazards that affect the Mad River Bridges project location and that thereby, according to Caltrans minimize the applicable geologic risks. This situation would, as discussed above, result in eventual loss of safe and effective public coastal access and coastal recreation. Therefore, denial of the proposed project would result in a development inconsistent with the requirements of Coastal Act Sections 30210, and 30214. For the reasons set

forth above, the Commission finds that there are no feasible alternatives available within the general project area that could be safely implemented consistent with the public coastal access and recreation policies of the Coastal Act, that would reduce the proposed project's adverse impacts on coastal agriculture.

Existence of a Conflict Between Chapter 3 Policies: Based on the above, the Commission finds that the proposed project presents a conflict between Sections 30241 and 30250 on the one hand, and Sections 30210 and 30214, on the other, that must be resolved through application of Section 30007.5, as described below.

4.3.6.3 Conflict Resolution: After establishing a conflict among Coastal Act policies, Section 30007.5 requires the Commission to resolve the conflict in a manner that is on balance most protective of coastal resources. As noted previously, the project would impermissibly and permanently convert prime coastal agricultural lands to highway use, and the 3.58 acres of prime agricultural land that would be thus converted represent both individually and cumulatively significant adverse impacts on coastal resources, thus making the project as proposed by Caltrans inconsistent with Sections 30241 and 30250 of the Coastal Act. However, denying the project because of its inconsistency with these policies would result in significant adverse effects on coastal public access and recreation resources due to the probability of a future compromise or collapse of the existing, aging bridges.

As stated, the conflict resolution provisions require that the conflict be resolved in a manner which on balance is the most protective of significant coastal resources. To meet this test, it is necessary that adverse impacts on coastal agricultural resources be mitigated to the maximum extent feasible. Caltrans proposes to undertake mitigation of the adverse impacts the Mad River Bridges project will have on coastal agricultural resources, including payment of \$2 million in mitigation funds to the College of the Redwoods Foundation for the purpose of enhancing the College's agricultural education program specifically to protect and maintain the Shively Farm (the College's 38-acre agricultural teaching farm) and to prevent its conversion to non-agricultural use, as discussed in detail herein, and as required pursuant to Special Condition 19 (Agricultural Mitigation).

The Commissions find that on balance, therefore, approval of the bridges to provide continued safe and enhanced public coastal access together with the provision of agricultural mitigation proposed by the College of the Redwoods agricultural education program enhancements as explained above and as set forth in Special Condition 19 is more protective of coastal resources than denial of the project. The Commission further finds that the College of the Redwoods agricultural education program enhancements will provide sufficient mitigation through agricultural education program enhancement -- including the recovery of a threatened agricultural education program and 38-acre agricultural teaching farm of importance to the North coast agricultural region -- such that with the mitigation, approving the proposed project will resolve the conflict in a manner which on balance is most protective of significant coastal resources.

To ensure that the agricultural mitigation benefits of the project that would enable the Commission to use the balancing provision of Section 3007.5 are achieved, the Commission attaches Special Condition No.19, which requires the applicant to provide to the College of the Redwood Foundation a non-refundable mitigation fee in the sum of two million dollars as proposed by the applicant after the College of the Redwoods Foundation and the Commission have entered into a agreement detailing how the funds would be used for the benefit of the Shively Education Center Sustainable Agricultural Teaching Farm to fund a full time teaching position for the purpose of agricultural education at the College of the Redwoods. The Commission finds that without Special Condition No. 19, the proposed project could not be approved pursuant to Section 30007.5 of the Coastal Act.

The \$2,000,000 deposit to be made into the account for the benefit of the Shively Farm pursuant to this special condition shall mitigate for the conversion of 3.58 acres of prime agricultural land associated with the reconstruction of the Highway 101 Mad River Bridge as authorized by Coastal Development Permit No. 1-07-013. The Commission finds that the proposed mitigation, which will help keep the approximately 38-acre Shively Farm from being converted to another use, provides more than enough mitigation to compensate for the conversion of 3.58 acres of prime agricultural land associated with the approved development. The Commission also acknowledges that the \$2,000,000 deposit made into the account for the benefit of the Shively Farm may also serve as mitigation for impacts to agriculture caused by other Caltrans projects. If those projects are authorized by Coastal Development permits granted by the Commission. Two such projects that will be considered involve the conversion of approximately 42 acres of agricultural land associated with the future development by Caltrans of the proposed Alton Interchange at Highway 101 and Highway 36 and the conversion of up to 2 acres of agricultural land associated with the future development by Caltrans of the proposed Klamath Grade Raise project along Highway 101 at Klamath.

Although the 38 acres of agricultural land that would be saved from conversion at the Shively Farm by the mitigation measure does not represent a straight one for one replacement of the total of 47.58 acres of agricultural land that would be converted for the three Caltrans bridge and highway development projects discussed above (Mad River Bridge, Alton Interchange, and Klamath Grade Raise), the Executive Director believes that certain aspects of the mitigation measure compensate for the smaller acreage. First, all of the 38 acres of agricultural land that would be protected at the Shively Farm consists of prime agricultural land. Much of the total of 47.58 acres of agricultural land that will be affected by the three bridge and highway projects value is not prime agricultural land. In addition, the Caltrans proposal to endow the agricultural education program at the College of the Redwoods in a manner that is focused on bolstering and revitalizing the Shively Farm provides other agricultural benefits to the broader community of the north coast as well. The College's program would protect and enhance the agricultural teaching function of the Shively Farm. The training of farmers will help sustain the areas agricultural economy by providing knowledgeable farmers to the region who will produce agricultural products that can sustain agricultural

use of the region's agricultural lands. The permanent teaching position would anchor faculty continuity and long term planning of the educational program to maximize the use of the Shively Farm. Finally, the program would provide outreach to the community in matters of agricultural sustainability. It is the Executive Director's opinion that with these added benefits, the mitigation measure as proposed and conditioned would adequately mitigate for the total of 47.58 acres of agricultural land that would be affected by the three bridge and highway projects. The Executive Director's opinion is based on the figures presented by Caltrans for the amount of acreage that would be affected by the three projects. If at the time the Alton Interchange and Klamath Grade Raise projects are acted on by the Commission the projections of acreage of agricultural land that would be converted by the projects significantly increases or the projects are determined to have additional adverse impacts on agricultural productivity not currently known, the Executive Director would not longer consider that the Shively Farm mitigation proposal as adequate to mitigate for the impacts of Alton Interchange and Klamath Grade Raise projects in addition to the Mad River Bridges project.

The Executive Director's opinion that the Shively Farm mitigation measure may be used to mitigate the above-specified conversion of agricultural lands at the Alton Interchange and Klamath Grade Raise projects cannot legally bind a future Coastal Commission in its future review of each of these two projects. A future Commission is free to accept or reject the mitigation fee as sufficient mitigation for each of those projects. However, the Executive Director has indicated to Caltrans staff that he will recommend at the time the Commission reviews coastal development permit applications for the Klamath Grade Raise and Alton Interchange projects that the mitigation required by Special Condition No. 19 is sufficient to mitigate for the conversion of 42 acres of agricultural land associated with the proposed Alton Interchange project and for the conversion of up to 2 acres of agricultural land associated with the proposed Klamath Grade Raise project.

4.3.6.4 Conclusion: Consistency with the Coastal Act

In sum, the Commission finds that while the construction of the new bridges at the Mad River highway crossing as proposed by Caltrans would cause adverse impacts on coastal agricultural resources, the new bridges would be sited and designed in a manner that Caltrans asserts will vastly improve public safety and long term improved coastal access and recreation due to the more reliable "lifeline" highway status of Highway 101 at this location that will result from the replacement of the old bridges with new bridges of a modern design consistent with Caltrans' current safety requirements. The Special Conditions of this report are necessary to ensure the proposed Mad River Bridges replacement project's adverse impacts are minimized and to the extent feasible, mitigated, and the benefits of the proposed project thus fully realized. Therefore, the Commission finds that approval of the proposed project notwithstanding its inconsistencies with several Coastal Act policies is "most protective of coastal resources" for purposes of the conflict resolution provisions of Coastal Act Section 30007.5.

5.0 OTHER AGENCY APPROVALS

The project requires review and authorization by the U.S. Army Corps of Engineers. Pursuant to the Federal Coastal Zone Management Act, any permit issued by a federal agency for activities that affect the coastal zone must be consistent with the coastal zone management program for that state. Under agreements between the Coastal Commission and the U.S. Army Corps of Engineers, the Corps will not issue a permit until the Coastal Commission approves a federal consistency certification for the project or approves a permit. The project also requires a Section 7 consultation by the National Marine Fisheries Service pursuant to the Federal Endangered Species Act and a Consistency Determination by the California Department of Fish & Game pursuant to the California Endangered Species Act. The project also requires a Section 1600 Streambed Alteration Agreement from the California Department of Fish and Game (CDFG). The project also requires a Section 401 Certification, National Pollutant Discharge Elimination System (NPDES) permit from the Regional Water Quality Control Board. Special Condition 3 requires Caltrans to submit evidence to the Executive Director, prior to issuance of CDP 1-07-013.

6.0 STATE WATERS

The project site entails areas which were submerged, intertidal and/or overflow lands at the time of California's statehood in 1850. The portion of the Mad River traversed by the proposed project is subject to tidal influence. Caltrans has previously submitted evidence that the State Lands Commission has reviewed the approved development proposal and granted Caltrans a lease for the use of the public trust lands affected by the proposed project. However, Caltrans staff notified Commission staff on December 12, 2007 that changes Caltrans has made to the proposed project now require a new or amended lease from the State Lands Commission, which Caltrans is presently seeking.

7.0 CALIFORNIA ENVIRONMENTAL QUALITY ACT

On June 17, 2005, Caltrans as lead agency certified Mitigated Negative Declaration (SCH 2003122015) for the subject "*US 101 On the Mad River Bridges Between Arcata and McKinleyville in Humboldt County, CA*" project, which incorporated the published responses of Caltrans to public comments.

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 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 impacts which 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.

EXHIBITS

- AA Project Location Map
- BB Project Location Map Also Showing Demello Mitigation Site, DFG Mad River Slough Wildlife Area and Arcata Marsh & Wildlife Sanctuary
- CC Shows Same as Exhibit BB, Except the Base Layer is a Color Aerial Photo
- DD Location Map Showing Project Site and Shively AG Mitigation Site
- EE Color Aerial Photo Showing Same as Exhibit DD, Plus Blow-up Aerial of Shively Site

- A Final ND
- B Mad River Bridges Replacement On-Site Wetland and Riparian Mitigation and Monitoring Plan, November 2007
- C Old Samoa Parcel Conceptual Mitigation Plan, November 2007
- D Jones & Stokes Transmittal Memo of Noise Analysis Reports
- E Analysis of Pile Driving Noise Impacts to Listed Salmonids for the Mad River Bridge Replacement Project, August 23, 2007 (Revised November 5, 2007)
- F Supplemental Pile-Driving Noise Analysis for the Mad River Bridge Replacement Project – DRAFT, November 2, 2007
- G Mad River Bridge Replacement Project: Evaluation of Underwater Noise Generated by Use of Smaller Piles (30-inch-Diameter) – DRAFT, November 6, 2007
- H Bioacoustic Footprint and Proposed Fish Exclusion Zone Map
- I Fish Exclusion to Avoid and Minimize Bioacoustic Impacts to Salmonids During Pile Driving During the Construction of Mad River Bridges, December 6, 2007
- J Fish Weir Background Information
- K Marine Mammal Monitoring Plan
- L Water Pollution Control Program for Mad River Bridge – Brushing Only
- M Constructability Alternatives Analysis
- N ADL Mapping
- O Fish Mitigation Proposal and Map

- P On-Site Wetland and Riparian Mitigation Map
 - Q Resource Properties Aerial Photo/Map of Demello Site in Relation of DFG and City of Arcata Resource Sites
 - R 1941 Aerial Photo of Demello Site
 - S Present Day Color Aerial Photo of Demello Site
 - T Aerial Photo of Agricultural Properties at Mad River Bridges Project Site
 - U Photo Simulations of Bridge, Pedestrian Walkway and Railings
(Note: Railing Does Not Have Bike Rail Shown Because We Are Working On a New Rail Design and Trying to Get Lower Height for Bike Rail)
 - V Bridge Plans
 - W Project Layouts
 - X Drainage Profiles and Layouts
 - Y Construction Access Map
-
- 1 Tsunami Hazard Map & Pamphlet, Humboldt Education Center, Humboldt State University
 - 2 "North Coast Journal" Articles on the College of the Redwoods' Shively Farm
 - 3 Impact-Hammer Installation of Heavy Steel Shell Piles at Caltrans' Stony Creek Bridge, Highway 32, Glenn County
 - 4 Caltrans' Authorization of "Silent Piler" Hydraulic File Installation System
 - 5 Review of Project Utilizing Hydraulic Pile System

CALIFORNIA COASTAL COMMISSION

NORTH COAST DISTRICT OFFICE
710 E STREET, SUITE 200
EUREKA, CA 95501
(707) 445-7833 FAX (707) 445-7877
www.coastal.ca.gov

**AMENDMENT TO COASTAL DEVELOPMENT PERMIT**

Date: **August 19, 2008**

Permit Application No.: **1-07-013-A1**

Issued to: **California Department Of Transportation (Caltrans), Attn: Gary Berrigan;
Pacific Gas & Electric Company, Attn: Tom de Age**

to:

Replace the northbound and southbound bridges crossing the Mad River on U.S. Route 101 between Arcata and McKinleyville in Humboldt County. The new structures would consist of 12 ft. lanes, 10 ft. outside shoulders, 5 ft. inside shoulders, and barrier rails. In addition, the northbound structure would also support an 8 ft. multipurpose accessway for non-motorized traffic. The Central Avenue on- and off-ramps will be realigned to connect to the new structures, and the northbound Central Avenue off-ramp/Route 200 intersection would be reconstructed. The existing bridges would support traffic until traffic is diverted onto the new structures, then be demolished. Seven culverts would be improved or replaced. One existing residence and existing utilities would need to be relocated.

at:

**U.S. Highway 101, Postmile 89.1 to R90, at the bridge over the Mad River,
McKinleyville (Humboldt County)**

has been amended to include the following changes:

Relocate an existing buried 8-inch diameter natural gas pipeline on the northern and southern ends of the Mad River Bridge to accommodate reconstruction of the bridge. The project includes trenching and installing approximately 2,300 feet of buried 8-inch steel pipe for distribution of gas. Trenches would be approximately 48 inches deep, 2 feet wide, with 16 inches of sand followed by backfill of native soil. In addition, the project includes excavating 4-foot by 8-foot holes to horizontal directional drill (HDD) and installing 6-inch steel casings across the highway at two locations, with insertion of 2-inch plastic pipes for distribution of gas. Existing gas lines to be deactivated would remain in place. PG&E would utilize Caltrans laydown area for storage of pipes, gravel and equipment. The job is estimated to be completed in three months.

This amendment was determined by the Executive Director to be immaterial, was duly noticed, and no objections were received or the Commission concurred with the Executive Director's determination of immateriality (Sec. 13166 (b)(2)).

EXHIBIT NO. 11**APPLICATION NO.**

1-07-013-A3 - CALTRANS

IMMATERIAL AMENDMENT

1-07-013-A1 (1 of 2)

1 of 2

AMENDMENT TO COASTAL DEVELOPMENT PERMIT

Date: August 19, 2008
Permit Application No.: 1-07-013-A1
Page 2 of 2

This amendment will become effective upon return of a signed copy of this form to the North Coast District office. Please note that the original permit conditions are still in effect.

Sincerely,

PETER M. DOUGLAS
Executive Director

By: **Robert Merrill**
District Manager

ACKNOWLEDGMENT

I have read and understand the above amendment and agree to be bound by its Conditions and the remaining conditions of Permit No: **1-07-013-A1**

Date: _____ Signature: _____

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.

CALIFORNIA COASTAL COMMISSION

NORTH COAST DISTRICT OFFICE
710 E STREET • SUITE 200
EUREKA, CA 95501
VOICE (707) 445-7833
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Hearing Date: August 10, 2012
Commission Action: **Approved with Conditions**
August 10, 2012

ADOPTED FINDINGS

Amendment Application No.: 1-07-013-A2

Applicant: California Department of Transportation

Project Location: U.S. Route 101, Mad River Bridges, between Arcata and McKinleyville, unincorporated area of Humboldt County.

Description of

Original Coastal Development Permit: Construct two new cast-in-place (CIP) concrete box girder bridges, reconfigure new on and off ramps and Central/Route 200 intersection, and demolish the existing bridges. The new bridges would be about 750 feet long, and each bridge would have two 12-foot-wide traffic lanes, a 5-foot-wide inner shoulder and a 10-foot-wide outside shoulder. The new northbound structure would also include an additional 8-foot-wide "multi-modal" (bicycle/pedestrian) corridor on the eastward side and landings at each end of the bridge. Demolish existing residence & outbuildings, relocate utilities, upgrade/install up to 10 culverts. Total grading of approximately 110,000 cubic yards (yd³) (19,638 yd³ cut, 89,995 yd³ fill, 14,786 yd³ export – including demolition debris). Excavate lead contaminated soils east of existing bridges & dispose as hazardous wastes. Construct a new scour pool approximately 100 feet down river of the new bridges to mitigate for stream channel impacts associated with loss of scour pool habitat at a former bridge in-water pier.

Description of Requested Amendment: (1) Retention, rather than demolition of, the portions of Piers 6 and 9 from their pier bases to a height corresponding to the elevation of one meter below ordinary ground level.
(2) Retention, rather than demolition of, the portions of Pier 8 from the pier base to a height corresponding to the elevation of Ordinary Low Water (OLW), and the installation of large woody debris enhancements onto the

EXHIBIT NO. 12**APPLICATION NO.**

1-07-013-A3 - CALTRANS

ADOPTED FINDINGS

1-07-013-A2 (1 of 35)

retained pier remnants for sustaining the existing scour pool habitat around the base of the pier.

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 August 11, 2012. The adopted conditions for approval of the development differ from those contained in the written staff recommendation dated July 27, 2012. At the hearing, staff presented an addendum which contained a letter from the applicant withdrawing portions of the project which the staff had recommended denial. The addendum also included revisions to the findings to adjust the staff recommendation to redact portions addressing the withdrawn portion of the project. The Commission adopted the changes to the staff recommendation in their entirety. The full text of the original July 27, 2012 staff recommendation report the August 9, 2012 addendum revising the staff recommendation, and the report exhibits, can be accessed at the following URL:

<http://documents.coastal.ca.gov/reports/2012/8/F13a-8-2012.pdf>

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APPENDICES

Appendix A: Substantive File Documents

EXHIBITS

Exhibit 1:	Regional Location Map
Exhibit 2:	Vicinity Map
Exhibit 3:	Amendment Project Features Locations
Exhibit 4:	Amended Project Description Overview Narrative
Exhibit 5:	Proposed Stream Channel Impacts Mitigation Plan
Exhibit 6:	Draft Proposed Long Term Compensatory Fish Impacts Mitigation Plan
Exhibit 7:	Proposed Mad River Fish Hatchery Weir Removal Mitigation Plan
Exhibit 8:	Draft Cooperative Interagency Agreement
Exhibit 9:	Piers 6 and 9 Location Maps
Exhibit 10:	Pier 8 Fish Habitat Mitigation and Enhancement Plan
Exhibit 11:	Excerpt, Adopted Findings for Coastal Development Permit No. 1-07-014

I. RESOLUTION

The following resolution, conditions, and findings were adopted by the Commission on August 11, 2006 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

Note: The original permit (CDP No. 1-07-013) contains twenty special conditions, seventeen of which are reimposed as conditions of CDP Amendment No. 1-07-013-A2 without any changes and remain in full force and effect. Special Condition Nos. 7, 10, and 17 are modified and reimposed as conditions of CDP Amendment No. 1-07-013-A2. Special Condition Nos. 21 through 23 are additional new special conditions attached to CDP Amendment No. 1-07-013-A2.

The modified and new conditions are listed below. For comparison, the text of the original permit conditions is included in Exhibit No. 11.

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.

For purposes of implementing the activities authorized by Coastal Development Permit 1-07-013-A2, the following definitions shall apply:

7. **Construction Responsibilities. A.** This permit authorization requires, and by accepting the benefits of CDP 1-07-013 and CDPA 1-07-013-A2, Caltrans agrees that:

- (1) No construction materials, debris, graded soils, waste, chemicals, fuels, or non-compliant dewatering effluent (effluent with turbidity, pH, or other water quality measure that does not comply with the requirements of the Regional Water Quality Control Board or other state or federal agencies), shall be stored, placed, or discharged within the Mad River corridor including streambeds or banks, or adjacent riparian areas, or other areas where it may enter the Mad River or other coastal waters, whether directly or indirectly, unless specifically and affirmatively authorized by these special conditions; and
- (2) No machinery shall be allowed at any time within the wetted channel of the Mad River corridor except during the construction windows specifically authorized by Special Condition 1.
- (3) The Executive Director may, through these provisions, authorize the limited use of equipment within the wetted channel during the season June 16 through October 14 annually, for the purpose of: a) constructing the temporary river crossing in years where such crossing is necessary, b) diverting the river channel as necessary provided the flowing channel is never reduced to less than fifty feet in continuous flowing channel width, and c) constructing the mitigation scour pool in Construction Year 3 or 4. Such authorization shall be provided through the Executive Director's approval of an annual river access plan that shall be submitted by Caltrans for the review and approval of the Executive Director not later than February 1, annually, for the following May 1 – October 14 season, or by May 1 annually if the river access plan will only address the June 15-October 16 access provisions, to allow sufficient time for iterative executive review and revision of the subject plan. The Executive Director shall review the subject plan in consultation with the fisheries biologists of the California Department of Fish and Game and the National Marine Fisheries Service. The Executive Director may authorize minor changes to the approved annual river access plan that Caltrans requests based on the fluctuating seasonal conditions of the river channel that become more pronounced as the rainy season ends, provided that no significant additional impacts to sensitive species or habitat would result from the proposed changes. The annual river access plan shall address all areas of project activities authorized by CDP 1-07-013 and shall provide a refined plan based on

the emerging river conditions and construction needs of the subject year for which the plan is proposed. The annual river access plan shall be prepared by the supervising and resident Caltrans engineers assigned to the subject project, together with the fisheries monitoring biologist and a Caltrans environmental planning staff biologist. The annual river access plan shall not be implemented without the final review and approval of the revised plan incorporating all changes required by the Executive Director.

- (4) Vehicles, equipment and materials allowed on the gravel bars in the river channel shall be limited to the minimum necessary to perform project activities. If the Caltrans site supervisor determines that this requirement is not met, the supervisor shall direct that the excess be immediately re-located outside of the river channel. No vehicles, equipment or materials, except as specifically authorized in the annual river access plan, shall be allowed within the ambulatory wetted channel of the river. Fueling on the dry gravel bars of the channel shall be subject to all BMPs and over-water fueling procedures that set the highest possible standards for fuel containment and spill response readiness, and shall be limited to major tracked vehicles such as cranes and stationery equipment such as generators and pumps that cannot feasibly be relocated outside of the corridor for fueling, with full containment of any potential fuel spill in place prior to commencement of any re-fueling operation, and verified by the fisheries biological monitor. All hydraulic fuels used within the river corridor shall be vegetable-based unless determined infeasible by the Caltrans site supervisor, who shall note such determination in the project records. Generators and other potential sources of fuel or oil spills shall be fully contained to prevent spills or leakage onto the gravel bar and shall be inspected at least twice per day for evidence of leaks or spills. No fuels shall be stored closer to the channel than the area defined as a minimum of one hundred (100) feet landward of the top-of-bank of the Mad River, and all fuels, oils or other potential contaminants shall be stored within areas protected by berms sufficient to contain the maximum spill that could occur within the bermed area and authorized for such placement, and in a manner that prevents spills or leaks from reaching the river corridor. Any leaks or spills anywhere on the subject site shall be cleaned up immediately and noted in the SWPPP reports and pertinent biological monitoring reports.
- (5) Staging and storage of construction machinery, materials, equipment, fuel, or any other material, or storage of debris or graded material, shall not take place within sensitive habitat areas or within the river channel except as specifically provided in these special conditions, and the perimeters of sensitive habitat areas shall be identified and marked in the field by a qualified biologist prior to commencement of construction and re-identified as often as needed thereafter to continuously maintain the identification and protection of sensitive habitat areas.
- (6) Demolition of the existing bridge or roadbed shall not be undertaken through the use of explosives, and no portion of the existing bridges may be demolished in a manner that allows debris to fall into the waters of the Mad River or onto the

native gravel bar. Construction debris shall be picked up from the bridges or debris-capture structures suspended from the bridges or other supports, and removed without use of the channel below as a landing for debris and other construction wastes and the channel may not otherwise be used for demolition except as authorized to stage the cranes and other equipment in use for demolition activities above the corridor. All construction debris generated by demolition activities shall be captured from the deck of the existing bridges, or from temporary structures or devices suspended below and/or adjacent to the structures being demolished, to capture the debris, even if this requires some traffic delays, rather than resorting to the method of allowing the debris to be dropped to the river corridor for retrieval there. Visible amounts of concrete dust and small rubble shall not be released into the air or water during construction and dust suppression measures shall be implemented. Dust control via water spray shall be implemented in a manner that does not generate excess water runoff into the river and shall be monitored by the fisheries monitoring biologist or the monitor's designated assistant or other biological monitor, so that excessive water contaminated by concrete dust does not drain into the banks, channel, or waters of the river. No portion of the demolition debris shall be allowed to enter the Mad River corridor at any time.

- (7) All debris, materials, equipment, vehicles, staging and storage features, concrete washout areas, de-watering facilities, the bermed fueling/fuel storage location, and any other material or temporary feature associated with project construction shall be removed immediately after project completion and the affected area returned to pre-construction conditions and restored in accordance with other special conditions set forth herein.
- (8) All waste material or excess graded material generated by demolition or construction shall be removed from the construction site and disposed of at a facility that is:
 - (a) located outside of the Coastal Zone, with necessary permits and approvals to accept the material for disposal or recycling; or
 - (b) inside the Coastal Zone at a facility demonstrated by Caltrans to the satisfaction of the Executive Director to have all necessary permits and approvals, including a coastal development permit where applicable, for such use. The location and volume of project wastes so disposed shall be documented by the resident engineer and noted in the biological monitoring reports submitted to the Executive Director. The disposal records shall be retained by Caltrans as part of the permanent project files and made available on request.
- (9) All lead-contaminated soils that will be disturbed in the areas east of the existing bridges shall be excavated and removed prior to any other disturbance of these areas (northeast quadrant of the proposed project site) only to the depth of the lead contamination concentrations that qualify for disposal as hazardous wastes, and

shall not be commingled or otherwise diluted by mixing the contaminated soils with other soils or materials. The lead-contaminated soils shall immediately be segregated through placement into appropriate containers for shipping and disposal as hazardous wastes, and shall be removed from the site for disposal at a licensed facility authorized to accept hazardous wastes immediately thereafter. The hazardous waste containers shall be logged and the record of final disposal maintained by the Caltrans supervising engineer and provided to the Executive Director within sixty (60) days of such disposal. The resident and supervising Caltrans engineers shall report the excavation and disposal to the biological monitor who shall record these reports in the biological monitoring reports required by the Special Conditions of CDP 1-07-013. Caltrans shall prepare an as-built site plan showing the location and extent of the excavation of lead contaminated soils at the same scale as the wetland mitigation plans proposed for Caltrans for installation at the affected locations after associated grading has been completed. The as-built site plan shall be submitted to the Executive Director within sixty (60) days of completion of the removal of the lead contaminated soils with an attached copy of the final wetland mitigation plan for the same location, demonstrating that the subject location will be free of hazardous lead contaminated soil and demonstrating that the subject location will be at or below background concentrations of lead as established by the Kearny Foundation of Soil Science, Division of Agriculture and Natural Resources, University of California published report, "Background Concentrations of Trace and Major Elements in California Soils (also available on the internet at : <http://www.envisci.ucr.edu/downloads/chang/kearney/hearneytext.html>.) The location and volume of project wastes so disposed shall be documented by the resident engineer and noted in the biological monitoring reports. The disposal records shall be retained by Caltrans as part of the permanent project files and made available on request.

- (10) Fueling shall take place in a single designated offsite area that is bermed and otherwise set up to fully contain any potential spill without release outside of the designated area, and the designated area shall be continuously equipped with all materials necessary to control and cleanup any spill that may occur. The integrity of the containment berm and the readiness of control and cleanup materials and equipment shall be periodically verified by the Caltrans site supervisor and noted in the permanent project records. The designated fueling/fuel storage area may not be located closer to the Mad River corridor than a minimum of 100 feet landward from the top of bank. Only equipment that cannot be readily relocated to the designated offsite fueling location may be fueled in other areas of the site (cranes, large tracked vehicles and stationery equipment only) and these shall be re-fueled only by a California Department of Fish and Game-certified over-water re-fueler, in a manner authorized in accordance with all requirements of the Department of Fish and Game and the Regional Water Quality Control Board, including but not limited to the requirement that such re-fueling be undertaken by a minimum of two crew members certified for such operations, with one on standby to shut off the flow of fuel and the other at the delivery point, in constant

communication with each other, with full deployment of absorbent pads with sufficient capacity to absorb the maximum amount of fuel that could escape from the fueling hose before shutoff occurs in the event of equipment failure. No fueling of any kind may take place anywhere on site except during daylight hours and when visibility is sufficient for the re-fueling crew to maintain visual contact.

- (11) Sufficient oil absorbent booms and/or pads shall be on site at all times during project construction to ensure an immediate, effective response to any spill that may reach the Mad River. Site personnel shall be verified as fully trained to deploy such equipment, and the presence of the booms/pads/equipment and the adequacy of personnel training shall be periodically verified by the Caltrans site supervisor and noted in the permanent project records. All equipment used during construction shall be free of oil and fuel leaks at all times, and where parked or operated within or over the river channel from top of bank to top of bank, oil pans or other containment materials or devices shall be continuously placed beneath such equipment to ensure that leaks that do arise will not enter the river environment. Vehicles or machinery cleared to enter the wetted channel, such as for construction of temporary crossings, shall be fully steam-cleaned, including the undercarriage, and inspected and verified to be free of leaks by the Caltrans site supervisor or designated representative before the subject vehicles or machinery are allowed to enter the wetted channel. No vehicles or machinery shall enter the wetted channel at any time unless under the constant supervision of the monitoring fisheries biologist and the Caltrans site supervisor.
- (12) Cement/concrete shall be prepared and poured or placed in a manner that will prevent discharges of wet cement, or waters that have been in contact with cement/concrete, into coastal waters. Such measures include but are not limited to placement of measures such as catch basins, mats or tarps beneath the construction area to prevent spills or overpours from entering coastal waters, and use of Baker Tanks to collect, test and potentially treat contaminated de-watering effluent. De-watering of effluent that has been in contact with cement/concrete or other potential contaminants shall not be de-watered into coffer dams or sediment basins within the river channel, or discharged directly into the Mad River or its tributaries. De-watered effluent that has been in contact with uncured cement or other potential contaminants shall only be pumped to the de-watering locations authorized for the non-riparian pasturelands upgradient from the river corridor and where such effluent will soak into the subject lands and will not run off into the Mad River or its tributaries, whether directly or indirectly.
- (13) Construction de-watering during the period defined annually as June 16 through October 2 may involve construction of a de-watering basin within the dry native gravel bar. The temporary basin must be located a sufficient distance from the nearest edge of the wetted channel to ensure sufficient filtration of discharged effluent to protect the water quality of the Mad River as advised annually by the Caltrans environmental engineer/water quality manager based on emergent river conditions. The sediment basin must be located within the area of the river that is

within the pertinent Fish Exclusion Zone (FEZ) established in active pile-driving seasons, when a FEZ is required pursuant to other special conditions set forth herein. The temporary sediment basin must include a filter fabric lining (or equivalent) to prevent the release of fines to the Mad River. The use of a temporary sediment basin during the pertinent season must include a monitoring program that includes monitoring of the dewatered effluent discharged to the temporary sediment basin, and upstream and downstream monitoring. Upstream and downstream monitoring points must be located no more than a maximum of fifty (50) feet from the temporary sediment basin location. A complete constituent list, monitoring frequency, and standards for water quality compliance shall be developed in the project SWPPP and reviewed and approved by the Caltrans environmental engineer/water quality manager prior to the SWPPP submittal to the Executive Director for review and approval.

- (14) Construction de-watering effluent produced during the October 3 through June 15 period annually (wet weather season for purposes of interpreting this provision), shall not be discharged at any location within bank to bank (within the river corridor) of the Mad River or its tributaries. If adjacent pasture fields are used for construction de-watering, all de-watered effluent shall be fully contained. Construction de-watering shall not result in standing water that persists for more than 72 hours. Areas used for construction de-watering shall be explicitly delineated on map layouts and these map layouts shall be incorporated into the project SWPPP. The use of a temporary sediment basin pursuant to subparagraph 13) above shall include a monitoring program that includes monitoring of the dewatered effluent discharged. A complete constituent list, monitoring frequency, and standards for water quality compliance shall be developed in the project SWPPP and reviewed and approved by the Caltrans environmental engineer/water quality manager prior to the SWPPP submittal to the Executive Director for review and approval.
- (15) Rinsate from the cleaning of equipment, including cement mixing equipment, shall be contained and handled only in upland areas where drainage to coastal waters is fully prevented, and otherwise outside of any environmentally sensitive habitat area or wetland or buffers thereto.
- (16) Reporting protocols and contact information for the appropriate public and emergency services/agencies in the event of a spill shall be prominently posted on site at all times.
- (17) All forms that may be utilized for wet concrete/cement pours shall be grout-sealed, or the equivalent, to prevent release of concrete/cement, and the grout shall be allowed to cure adequately and be water-tested under the supervision of the fisheries or general biological monitor and the resident engineer to ensure complete seal before any wet concrete/cement or other chemical treatments may be applied to the forms. No placement/pour of concrete/cement within or above

the river channel from top of bank to top of bank, including within de-watered coffer dams, shall occur unless the fisheries biological monitor is present.

- (18) No vegetation removal, including clearing, grubbing, limbing, trimming, or other disturbance of existing vegetation may occur between March 1 and August 31 of any year unless a qualified biologist provides a survey undertaken to the satisfaction of the Executive Director not less than ten (10) days prior to proposed commencement of such activities, demonstrating conclusively that no birds are nesting in the area that would be affected, and the results of the survey have been provided to the Executive Director's satisfaction not less than five (5) days prior to proposed commencement of such activities, and the vegetation removal has additionally been authorized by a California Department of Fish and Game biologist familiar with the bird species likely to nest in the subject area.
- (19) Exclusionary netting shall not be used. Nesting that would be affected by project activities shall be discouraged by timely removal of attempted nests which must be performed by, or performed under the direct supervision of, a qualified biologist. Such activities shall be logged by the pertinent biological monitor. Nesting shall be allowed on any structure that is not scheduled for demolition during the forthcoming nesting season and the contractor shall be required to schedule demolition outside of the nesting season unless Caltrans demonstrates to the satisfaction of the Executive Director that such delay would imperil the project schedule to the extent that an additional year of site disturbance could result.
- (20) Placement of temporary Rock Slope Protection and other slope stabilization measures annually, before October 15, may be authorized by the Executive Director if no more effective method of erosion control is available. The preferred method of erosion control shall be the anchored placement of geotextiles and mulch provided these would be stable and would not contribute to discharge into the river waters during the rainy season. If RSP is used, the RSP must be placed, removed, and stored annually in compliance with the other provisions of CDP 1-07-013 and must be finally disposed in accordance with the waste disposal provisions of this Special Condition. No RSP may be placed permanently within the bed and banks, from top-of- bank to top -of -bank of the river channel, except as specifically shown on the proposed project plans for the areas of the new bridge abutments that are located above the 100-year flood plain. No permanent placement of RSP below the limits of the 100-year flood plain is authorized by CDP 1-07-013 except for the construction of the scour hole that will be constructed after pile-driving has concluded, in accordance with the mitigation required by the National Marine Fisheries Service for loss of the scour hole at the existing bridge pier. RSP and other materials such as woody debris shall be placed in accordance with plans and provisions authorized by the Executive Director in consultation with the fisheries biologists of the NMFS and the California Department of Fish and Game.

- (21) Upon the completion of the Pier 6 and 9 demolition to one meter (1 m.) below ordinary ground level, the excavation shall be back-filled with clean material matching the composition and compaction of surrounding soil and earthen materials, to an elevation and slope matching that of the surrounding terrain.
- (22) The Pier 8 demolition work shall be limited to: (a) wire saw cutting of the aerial portion of the pier to as close to the Ordinary Low Water (OLW) summer flow water surface elevation as possible; and (b) additional demolition by pneumatic jack hammers of the remaining portion of the concrete column necessary to stabilize the logs used in the large wood debris habitat enhancement feature. Prior to removal of the pier column, an impermeable membrane material (such as a rubber pond liner) shall be secured and sealed around the column just below the OLW saw cut elevation. The membrane shall be formed into a basin around the perimeter of the column. Water and cutting slurry generated from the concrete cutting operation shall be collected in the basin and pumped into a portable water tank for disposal at an offsite location, consistent with Special Condition No. 10.F.
- (23) Construction of the Pier 8 scour hole fish habitat enhancement structure authorized by CDP Amendment No. 1-07-013-A2 shall employ water quality Best Management Practices (BMPs), such as catch tarps, and vacuum cleaning, during the drilling of holes into both the wooden debris members and the pier concrete to prevent boring wastes from entering coastal waters.
- B. All project activities shall be undertaken at all times in full compliance with these requirements. Any project changes to these requirements shall be reported to the Executive Director. No changes to these requirements may be approved without ~~an~~ a further amendment to CDP 1-07-013, unless the Executive Director determines that no amendment is legally required.
10. **Water Quality Protection.** A. Caltrans shall conduct the limited amount of vegetation clearance and site disturbance necessary to undertake the pile load testing southwest of the proposed bridges, in the general area of proposed Pier 2, in full compliance with the limited plan for Best Management Practices submitted by Caltrans. The vegetation removal and the pile load testing at Pier 2 shall be undertaken after September 1, 2008 and the vegetation removal shall not exceed that shown in the crosshatched area identified in Addendum Exhibit GG. Minor trimming of vegetation overhanging the existing road, but not vegetation beyond such overhang, may be undertaken along the existing access road immediately west of Wymore Road for the purpose of accessing the construction site. No access to, or modification of the bed and banks of the Mad River is authorized pursuant to Subparagraph A herein.
- B. Not later than July 1, 2008, or within such additional time as the Executive Director may grant for cause, Caltrans shall submit for the review and approval of the Executive Director a Phase I Storm Water Pollution Prevention Plan (SWPPP)

that shall be comprehensive in scope but shall apply only to the pile-load testing activities Caltrans proposes to undertake after September 1, 2008 at the proposed Pier 2 location shown on Addendum Exhibit GG. If any de-watering is necessary to undertake the subject work addressed by the Phase I SWPPP, then the effluent produced by such de-watering shall be discharged only to pasturelands in the southwestern quadrant of the subject project area. Any excess effluent that cannot be absorbed by the treated pasturelands shall be temporarily contained in storage tanks or other upland containment within the southeastern quadrant pasturelands until sufficient evaporation or percolation has occurred. No discharge to the Mad River for activities subject to the Phase I SWPPP shall occur unless the Executive Director approves an amendment to the Phase I SWPPP upon a showing of evidence to the Executive Director's satisfaction that all water quality standards protective of the waters of the Mad River will be met. The Executive Director shall determine whether the Phase I SWPPP is adequate to control erosion and to prevent contamination of the waters of the Mad River and associated damage to sensitive species during the proposed pile-testing activities undertaken after September 1, 2008. Proposed activities subject to the provisions of the Phase I SWPPP shall not commence until the Executive Director's approval has been granted.

- C. Not later than October 1, 2008, or within such additional time as the Executive Director may grant for cause, Caltrans shall submit for the review and approval of the Executive Director a complete Phase II SWPPP for all other project activities not covered by the Phase I SWPPP. The Executive Director shall determine whether the SWPPP is adequate to control erosion and to prevent contamination of the waters of the Mad River and associated damage to sensitive species during the proposed construction period authorize pursuant to CDP 1-07-013. If the Executive Director determines that the SWPPP is not adequate for this purpose, project activities other than those specifically authorized by Subparagraph A above shall not commence until all changes required by the Executive Director have been made and published in a revised SWPPP to the satisfaction of the Executive Director. Caltrans shall allow a minimum of thirty (30) days for the final review by the Executive Director for the purpose of determining that all previously requested changes to the draft Phase II SWPPP have been made. It shall be Caltrans' responsibility and the responsibility of the pertinent contractor to ensure that the draft SWPPP is prepared and submitted on a pre-construction timeline that allows for the full sequence of this iterative review, which could require at least 120 days, or longer if substantial changes to the draft SWPPP are necessary.
- D. In addition to other requirements set forth in this or other special condition(s) set forth herein, the Phase II SWPPP shall specifically develop a construction de-watering plan for both dry weather and wet weather seasons. For purposes of interpreting provisions of these special conditions pertaining to construction de-watering requirements, the dry weather construction season shall be defined in accordance with the standards of the North Coast Regional Water Quality Control

Board as May 1 to October 1, annually, and the wet weather construction season shall be defined as October 2 to April 30, annually. The construction de-watering plan shall discuss methods, a monitoring program, and corrective actions that may be necessary, that is specific for both the dry weather and wet weather seasons, the pasturelands become so saturated that the effluent cannot filter adequately, project activities requiring de-watering shall be stopped until adequate infiltration capacity has been restored. Nothing in these provisions shall authorize alternative de-watering through the use of any structures such as coffer dams within the wetted channel of the Mad River.

- E. In addition to the other requirements of this or other special condition(s) set forth herein, the Phase II SWPPP shall contain specific Best Management Practices (BMPs) for work undertaken during the May 1 – June 15 time period annually as authorized in Special Condition 1(A) *et. seq.* above. These BMPs shall address the specific activities proposed within the river corridor during this annual window of time and shall provide BMPs adequate to ensure the protection of the water quality of the Mad River if unexpected precipitation occurs while such activities are underway.
- F. Drilling muds or spoils associated with foundation installation, coffer dam excavation or other project activities shall be removed immediately from the river corridor and de-watered or disposed outside of the area of the corridor defined for purposes of interpreting the requirements of this special condition as any location closer to the river than a minimum of 100 feet landward of the top of bank of the river. Water and cutting slurry generated from concrete cutting operations associated with demolition of Pier 8 and the installation of the scour pool large woody debris enhancement structure shall be collected in an impermeable membrane material (such as a rubber pond liner) secured and sealed around the column just below the Ordinary Low Water (OLW) saw cut elevation. The membrane shall be formed into a basin around the perimeter of the column. Water and slurry collected in the basin and pumped shall into a portable water tank for disposal at an offsite location approved by the Executive Director. Construction of the Pier 8 scour hole habitat enhancement structure shall employ water quality source control Best Management Practices (BMPs), such as catch tarps, and vacuum cleaning, during the drilling of holes into both the wooden debris members and the pier concrete to prevent boring wastes from entering coastal waters. No effluent from such de-watering shall be allowed to reach the banks or bed of the Mad River at any time, and should such release occur, the project shall be shut down immediately until the discharge has been contained and fully resolved. Should such discharge occur, the discharge shall be immediately reported to the Executive Director and to the fisheries biologists of the California Department of Fish and Game and the National Marine Fisheries Service, and to the appropriate representative of the Regional Water Quality Control Board.

- G. De-watered effluent that will be generated by activities associated with maintaining coffer dams, drilling, sediment de-watering, or pile-driving and related work, shall not be directed into coffer dams in the river channel.
 - H. The Phase II SWPPP may additionally include a construction de-watering plan that relies on discharge to a SEDIMENT BASIN constructed within the dry native gravels of the river bar. The plan for use of a sediment basin shall specify that such basin may only be used annually from June 16 – October 14, and may only be used for discharge of de-watering effluent that has not come into contact with uncured concrete or other potential contaminant. The plan shall specify a setback from the outer boundaries of the sediment basin to the nearest edge of the wetted channel that is deemed sufficient by the Caltrans environmental engineering/water quality staff to provide adequate filtration of effluent discharge protective of the waters of the Mad River. The plan shall require that the sediment basin be lined with filter cloth to prevent discharge of sediment contamination to the waters of the river. The plan shall require the removal of all sediments and filter cloth prior to re-grading of the sediment basin at the end of the annual construction season. The plan shall require that the sediment basin be removed and re-graded in accordance with the pertinent annual construction access plan or as the fisheries biologists of the National Marine Fisheries Service and the California Department of Fish & Game may direct. No de-watering within the river corridor shall be allowed unless undertaken in accordance with these requirements.
 - I. Caltrans shall undertake development in accordance with the approved final Phase I and Phase II SWPPP plans. Any proposed changes to the approved final SWPPP shall be reported to the Executive Director. No changes to the approved final SWPPP shall occur without a Commission amendment to this coastal development permit unless the Executive Director determines that no amendment is legally required.
17. **Assumption of Risk.** By acceptance of Commission approval of CDP 1-07-013 and CDP Amendment No. 1-07-013-A2, Caltrans acknowledges and agrees: (i) that the site of the proposed Mad River Bridge project including relocated elements of Route 101 to the point of conformity with the existing highway, and the proposed new pedestrian landings on the north and south ends of the pedestrian corridor on the eastward side of the northbound bridge, 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.

21. Pier 8 Scour Hole Habitat Large Woody Debris Enhancement. Construction of the Pier 8 scour hole habitat enhancement structure shall be subject to the following design and operational limitations:

- (A) An array of no more than nine (9) trunk logs with attached root ball or log stems and separate root wad assemblages, oriented longitudinally with the long axes of the pier footings, as generally described and depicted in "Fish Habitat Retention Proposal," dated July 13, 2012, attached to this staff report as Exhibit No. 10, shall be installed onto the Pier 8 eastern and western footing remnants.**
- (B) The large woody material shall be secured by mechanical anchors including bolts, cables, and/or steel dowels attaching the enhancement structure directly to the Pier 8 footings. No revetment rock, guy lines, "deadman" anchors, or other materials shall be placed within the live waters of the river to secure the woody materials. All mechanical anchors shall be positioned so as to be hidden from view to the maximum extent feasible.**

22. Pier 8 Scour Hole Enhancement Monitoring Program. A. PRIOR TO ISSUANCE OF COASTAL DEVELOPMENT PERMIT AMENDMENT NO. 1-07-013-A2, the applicant shall submit for review and approval of the Executive Director, a restoration monitoring program. The restoration monitoring program shall include provisions for monitoring the Pier 8 scour hole habitat enhancement structure that is the subject of CDP Amendment No. 1-07-013-A2 and shall at a minimum include the following:

- (1) Provisions for submittal within 30 days of completion of the initial restoration work of "as built" plans demonstrating that the initial restoration work has been completed in accordance with the approved restoration program.**
- (2) Provisions to ensure structural components of the habitat feature (i.e., logs and root wads) shall be periodically inspected to ensure the structure's stability and integrity to withstand seasonal high river flows. Permittee shall notify the Executive Director of any remedial actions needed to be undertaken to replace lost materials, or to remove problematic accumulated debris if monitoring indicates such action is required to ensure proper functioning as a fish habitat enhancement structure or to avoid impacts to coastal resources.**
- (3) Provisions to ensure the scour feature shall be monitored on an annual basis for five (5) years after construction. Measurements of the width and depth of the scour feature will be recorded to ensure that it is self-sustaining fish habitat feature. Photo documentation of the stability of the structure shall be**

taken from GPS coordinate-tied locations upstream, downstream and laterally from the south bank opposite of Pier 8.

- (4) Provisions to ensure annual monitoring reports shall be submitted to the Executive Director by February 1 of each year for five (5) years following completion of construction of the enhancement structure. The monitoring reports shall document any changes that have occurred in the enhancement structure and the scour pool dynamics and bathymetry in the vicinity of Pier 8, and identify any maintenance responses or adaptive management actions needed to be undertaken, for sustaining the structure's fish and wildlife habitat functions, and/or avoiding or compensating for impacts to coastal resources, including but not limited to bank stability. Water quality, public access safety, or visual resources.
 - (5) Provisions for submission of a final monitoring report to the Executive Director at the end of the five-year reporting period. The final report must be prepared in conjunction with a qualified biologist. The report must evaluate whether the restoration site conforms with the goals, objectives, and performance standards set forth in the approved final restoration program. The report must address all of the monitoring data collected over the five-year period.
 - (6) Provisions to ensure that the restoration site will be remediated within one year of a determination by the permittee or the Executive Director that monitoring results indicate that the scour feature does not meet the objective that the scour feature is sustaining the scour pool's fish and wildlife habitat functions or is creating impacts to coastal resources, including but not limited to bank stability, water quality, public access safety, or visual resources.
- B. If the final report indicates that the scour feature does not meet the objective of sustaining the scour pool's fish and wildlife habitat functions or is creating impacts to coastal resources, the applicant shall submit a revised or supplemental restoration program to compensate for those portions of the original program which did not meet the objective and/or are creating impacts to coastal resources. The revised restoration program shall be processed as an amendment to this coastal development permit unless the Executive Director determines that no amendment is legally required.
- C. The permittee shall monitor and remediate the restoration site in accordance with the approved monitoring program. Any proposed changes from the approved monitoring program shall be reported to the Executive Director. No changes to the approved monitoring program shall occur without a further Commission amendment to this coastal development permit unless the Executive Director determines no further amendment is legally required.

23. Final Revegetation and Erosion Control Plan Associated with Demolition and Removal of Old Bridge Piers 6, 8, and 9. PRIOR TO ISSUANCE OF CDPA 1-07-013-A2, Caltrans shall submit for the review and approval of the Executive Director, a Final Revegetation and Erosion Control Plan and a Revised Final Revegetation and Erosion Control Plan, respectively, for all areas disturbed by construction associated with the demolition and removal of old bridge Piers 6, 8, and 9.
- A. Plan Contents. (1) The plan shall be prepared by a qualified botanist with knowledge of the flora of the Mad River and environs. The plan shall provide for both temporary and permanent erosion control and revegetation utilizing only regionally appropriate or locally grown or collected native plant seeds or materials. The plan shall set forth revegetation performance standards and milestones to ensure the ecological and erosion control success of the plantings subject to the review and approval of the Executive Director.
- (2) All proposed plantings other than for the areas being returned to agricultural use shall be obtained from local genetic stocks within Humboldt County. The Executive Director may authorize limited, minor exceptions to this standard upon a showing of evidence to the Executive Director's satisfaction that locally obtained materials are not available. In no case shall plant species listed as problematic and/or invasive by the California Native Plant Society, the California Invasive Plant Council, or by the State of California be planted or allowed to naturalize or persist on the parcel. No plant species listed as a 'noxious weed' by the State of California or the U.S. Federal Government shall be utilized within the property.
- (3) All disturbed soils shall be secured by erosion control measures before and during the rainy season, and permanent plantings shall be protected with slope stabilization measures until sufficient cover and root mass ensures that erosion is fully controlled.
- (4) Weed control measures shall be implemented throughout the disturbed areas associated with the demolition of Piers 6, 8, and 9 subject to revegetation, for a minimum of five (5) years following the end of construction, and annual removal of Himalayan blackberries in these areas shall be included in the weed control efforts.
- (5) All revegetation activities, including monitoring, adaptive management, and reporting, shall be undertaken or supervised by a qualified botanist.
- (6) All plantings shall be maintained in good condition for the life of the development approved by CDPA 1-07-013-A2, and shall be watered, weeded, replaced, and otherwise maintained by Caltrans as necessary to achieve and maintain this standard. It shall be the responsibility of Caltrans to repair and remediate any erosion that occurs in any area disturbed during the

construction or operation of the development approved by CDPA 1-07-013-A2 for the life of the approved project.

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

IV. GENERAL FINDINGS AND DECLARATIONS

A. PROCEDURAL ISSUES

Jurisdiction and Standard of Review

The project site is located in the Commission's retained permit jurisdiction. The County of Humboldt has a certified Local Coastal Program (LCP), but the site is within an area shown on State Lands Commission maps over which the State retains a public trust interest. Therefore, the standard of review that the Commission must apply to the project is the Chapter 3 policies of the Coastal Act.

Scope

This staff report addresses only the coastal resource issues affected by the proposed permit amendment, provides recommended special conditions to reduce and mitigate significant impacts to coastal resources caused by the development as amended in order to achieve consistency with the Coastal Act, and provides findings for partial conditional approval and partial denial of the amended development. All other analyses, findings, and conditions related to the originally permitted development, except as specifically affected by the current permit amendment request and addressed herein, remain as stated within the original permit approval adopted by the Commission on January 11, 2009 attached as Exhibit No. 11.

B. AMENDMENT DESCRIPTION

Project Background and Amendment Overview

On January 8, 2008, the Commission approved with conditions Coastal Development Permit (CDP) Application No. 1-07-013 for the Mad River Bridges Replacement Project as proposed by the California Department of Transportation (Caltrans), entailing the construction of two concrete span bridges to replace the aging, structurally- and seismically-deficient bridges of U.S. 101's crossing of the Mad River, approximately one mile north of the City of Arcata in unincorporated Humboldt County (see **Exhibit Nos. 1-2 and 11**). As proposed and authorized under the original CDP, construction of the replacement bridges was anticipated to be completed over a four year period, with the in-water construction activities limited to specific seasonal periods to minimize 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.

On August 8, 2008, the Commission granted Coastal Development Permit Immaterial Amendment No. 1-07-013-A1, authorizing the relocation of an existing buried eight-inch-diameter natural gas pipeline on the northern and southern ends of the Mad River Bridge to accommodate reconstruction of the bridge. Construction on the replacement bridges commenced in earnest in the spring of 2009 and will continue until anticipated project completion in fall/winter 2012.

Caltrans now proposes a further amendment the original permit. The requested amendment seeks authorization for the agency to retain portions of the three sets of piers of the former bridges that were previously proposed and required to be fully demolished. In place of razing Piers 6 and 9 down to their wooden piling underpinnings, extrication would be discontinued at one meter below the ordinary ground surface. This modification would reduce the degree of ground disruption that would have effects on riverine water quality, while removing the aerial portions of the pier to a depth where the remnants would not pose similar potential adverse impacts to site stability from scour-related erosion at some future time. Similarly, the aerial portions of Pier 8 would be removed only down to the Ordinary Low Water elevation of the river, and large woody debris fish habitat materials installed onto the pier remnants to sustain and enhance the existing scour pool aquatic habitat in existence in the river around the pier base. This latter work to sustain and enhance the existing pool habitat would be performed in place of constructing a new scour hole down river of the new bridges, as was proposed and approved in the original permit, intended to mitigate for the loss of habitat that would have resulted from full demolition of Pier 8. These two project modifications are described in further detail below.

Proposed Partial Retention of Piers 6 and 9

Caltrans proposes that portions of the former bridges' Piers 6 and 9 be retained. These structures are situated outside of the live waters of the Mad River, but within its 100-year floodplain (see **Exhibit No. 9**). This project modification represents a refinement of the original Mar River Bridges Replacement Project in which full demolition and extrication of the pier footings down to their wooden pile underpinnings had been proposed by the applicant and authorized by the original permit. Subsequent to the permit approval, Caltrans reassessed the need for full subsurface removal of the piers. Insofar as the footings of Piers 6 and 9 are 52 feet and 48 feet landward of the top of their respective north and south river banks, neither footing would be subject to scour by the Mad River where their future potential exposure would indicate a need for more extensive removal at depth. Consequently, in the interest of further reducing the impacts to the riverine and riparian corridor resources associated with such significant ground disturbing excavation, the applicant is now proposing to limit demolition of the piers to removal down to one meter below the ordinary ground surface, as specified in Caltrans' Construction Standard Specifications.

Proposed Partial Retention and Habitat Enhancement of Pier 8

Finally, the applicant is proposing a similar change to the formerly proposed full demolition of Pier 8, situated within the live waters of the Mad River along its northern bank. Similar to Piers 6 and 9, the bridges replacement project as originally approved provided that the structure would be fully demolished down to its base, approximately 40 feet below the bottom of the river, entailing the extrication of approximately 100 tons of steel-reinforced concrete. In the course of performing such demolition, the scour pool that had formed at the base of the pier footings would have been coffer-dammed off of the watercourse, excavated, and back filled to an elevation matching the surrounding river bottom contours, effectively obliterating the fish habitat the pool afforded. Such pools provide deep water areas where resident and anadromous fish species may hold and feed. To mitigate for the loss of fish habitat, the original approved project included the creation of a new scour pool approximately 100 feet downriver of the replacement bridges on the river's south bank (see **Exhibit No. 3**).

Caltrans has reevaluated the formerly envisioned full subsurface removal of Pier 8 and offsite mitigation of the associated loss of scour pool habitat, and now proposes to retain and enhance habitat at Pier 8 for two reasons: First, the downriver replacement scour hole would likely not be self-sustaining due to its location in an area of the channel where sediments are deposited rather than being transported further down stream. Secondly, complete removal of the footing of Pier 8 would result in greater impacts to river resources, particularly water quality. The applicant cites past experiences with removal of pier footings on the Ten Mile Bridge Replacement Project where it was virtually impossible to completely remove the water at the bottom of the coffer dam around the piers. This situation is further exacerbated by the existing shoreline revetment in proximity of the pier which would likely cause deformation of the sheet piling used to dam the pier off from the river waters, with the resulting seepage of entrained sediment, demolition debris, and other contaminants into coastal waters. In addition, subaerial demolition of the pier would involve construction equipment that would generate significant levels of audible noise vibrations that could have significant hydroacoustic impacts to fish and other aquatic organisms.

Accordingly, Caltrans now proposes to avoid loss of the habitat afforded by the existing scour pool and minimize demolition impacts by scaling the removal of the pier to the portions above the Ordinary Low Water elevation of the river. In addition, the structure would be enhanced through the attachment of an array of large wood debris to the top of the pier footing remnants to retain the scouring effects of the vertically shortened pier stanchion by providing an appropriately sized and positioned in-water obstruction that would continue to deflect the flow of river waters in a manner as to sustain the existing scour pool at the base of Pier 8. The large wood debris enhancement structure would also provide substrate for arthropods on which the fish would feed, and afford shade and cover to the underlying scour hole.

As now proposed, the Pier 8 column would be cut with a wire saw as close to the summer flow water surface elevation as possible. Additional demolition of the concrete column to stabilize the logs used in the large woody debris fish habitat enhancement habitat feature would involve the use of pneumatic jack hammers. Although there would be no in-water demolition work, above-water removal of concrete would necessitate containment of the resulting demolition debris. An impermeable membrane material (such as a rubber pond liner) is proposed to be secured and sealed around the column just below the saw cut elevation. The membrane would be formed into a basin around the perimeter of the pier. The resulting water and cutting slurry generated from the concrete cutting operation would be collected in the basin and pumped into a portable water tank for disposal at an off site location.

Construction of the fish habitat enhancement structure would involve placing and securing large woody material on the Pier 8 footing. As detailed in the submitted preliminary plans, an array of approximately nine Douglas-fir and redwood logs with attached root balls or log stems and separate root wads would be mounted onto the eastern and western bridge footings that comprise Pier 8. Once in place the enhancement structure would occupy an approximately 85-foot-long by 15-foot-wide, 1,300 square-foot area around the pier remnants, positioned up off of the channel bottom, atop and laterally along the pier remnants at the annual low-flow water surface elevation. (see **Exhibit No. 10**). The logs and their attending rootballs/wads would be oriented in an up stream orientation to provide a surface on which additional debris might accumulate. Mechanical anchors including bolts, cables, and steel dowels would be used where needed to

attach the woody debris to the footings. The mechanical anchors would be located so to be as hidden from view as possible so that the structure has a natural appearance. This attachment work would involve drilling holes into both the wood and the concrete of the pier remnant. Best Management Practices (BMPs) such as catch tarps, and vacuuming, would be used to minimize discharges of dust and cuttings to incidental levels.

The applicant also proposes to monitor the effectiveness of the enhancement program. Baseline information regarding the width and average and maximum depths of the existing scour hole would be documented prior to the start of construction of the pier enhancements. The scour feature would also be monitored on an annual basis for five years after construction. The width and depth of the scour feature would be measured to ensure that the pool is self-sustaining. The structural integrity of the habitat enhancement feature (i.e., logs, root balls/wads, and attachments) would also be inspected to ensure that the structure is withstanding the fluvial forces of seasonal high flows. Photo-documentation from fixed locations upstream, downstream and from the south bank of the river would be performed to assess the stability of the structure. Remedial action would be taken if monitoring indicates it is needed. Annual monitoring reports would be submitted to requesting agencies by February 1 of each year for five years following completion.

V. FINDINGS AND DECLARATIONS FOR APPROVAL

The findings in this section apply only to that portion of the proposed project that is described in Part 1 of the Commission's resolution on this permit application, which portion is therefore being conditionally approved.

A. COMPONENTS OF AMENDMENT REQUEST CONDITIONALLY APPROVED

The two components of the permittee's amendment request that are being conditionally approved are as follows:

1. retention, rather than demolition of, the portions of Piers 6 and 9 from their pier bases to a height corresponding to the elevation of one meter below ordinary ground level; and
2. retention, rather than demolition of, the portions of Pier 8 from the pier base to a height corresponding to the elevation of Ordinary Low Water (OLW), and the installation of large woody debris enhancements onto the retained pier remnants for sustaining the existing scour pool habitat around the base of the pier.

B. AVOIDANCE AND MINIMIZATION OF HAZARDS

Section 30253 of the Coastal Act states, in applicable part:

New development shall do all of the following:

- (a) *Minimize risks to life and property in areas of high geologic, flood, and fire hazard.*

- (b) *Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs...*

The project as proposed to be amended would entail the retention of portions of an existing bridge pier obstruction within the perennial low-flow channel of the Mad River (Pier 8) and further adornment of that structure with an assemblage of large woody debris for the specific intension of sustaining the scour dynamics around the base of the pier to conserve the deep water habitat the scour hole affords to migratory and resident fish species.

Stream restoration projects, although intended to re-establish or improve habitat conditions for fish or aquatic species, have on occasion led to disastrous results due to poor planning or execution. Like gravel mining and other in-water development, restoration activities involving pit-mining or trenching within active river channels may result in incision upstream of the mine (by nick-point migration) and downstream (by sediment starvation). Incision may cause undermining of structures, lowering of alluvial water tables, channel destabilization and widening, and scouring on adjoining riverbanks, ironically leading to a loss of aquatic and riparian habitat if not properly undertaken.

Numerous examples on North Coast rivers and streams, especially on the Russian River in Mendocino County, Dry Creek in Sonoma County, and Redwood Creek and the lower Eel / Van Duzen River system in Humboldt County can be cited where channel modifications such as trenching in particular has led to lateral avulsion, channel capture, head-cutting, incision, nick-point migration, increases in the rate of meander straightening, decreases in channel sinuosity, lateral erosion of adjacent river banks and point bars, and other profound stream morphologic changes either upstream, downstream or within the excavated reach.¹ These changes can dramatically impact key salmonid habitat attributes by creating discontinuous areas within the floodplain where migrating fish would become stranded during low-flows, cause increases in water temperature due to loss of riparian vegetation, cause elevated sediment levels within the water column, form blockages at tributary confluences, simplify aquatic bed habitat through the removal of large woody vegetation, and other impacts to holding, rearing, and spawning habitat for migratory fish.²

Although such impacts can occur from channel modifications, the existing conditions at Pier 8 which formed a deep-water pool that has sustained itself for decades have created an apparent stasis between the scouring erosive forces caused by the presence of the pier obstruction and the stability of the surrounding river bathymetry and stream banks. With the exception of ongoing past maintenance by Caltrans to periodically remove problematic debris whose hydraulic resistance was causing lateral loading onto the former bridge footings and exacerbating localized scour around Pier 8 itself, no significant aggrading, degrading, or avulsive changes in the cross-

¹ *Impact Assessment of Instream Management Practices on Channel Morphology*, Aquafor Beech, Limited. & Step by Step, September, 1999

² *Management of Course Sediment on Regulated Rivers*, Report No. 80, California Water Resources Center, University of California, Davis, October 1993

section profile of this reach of the river have occurred over the last several decades that could be directly attributed to scour around the base of the structure. Moreover, given the relatively small scale of the proposed enhancement structure improvement, comprising an approximately 15-foot-wide by 85-foot-long, 1,300 square-foot area, and the proposed linear orientation of the proposed large woody debris enhancements, the Commission's staff geologist, Mark Johnsson PhD, has indicated that the project would not likely result in an increase in levels of vortex scour to a degree that would result in adverse impacts on the stability of nearby river cliff faces or channel morphology.

Therefore, the Commission finds the project as proposed to be amended to partially retain and enhance Pier 8 for fish habitat has been designed to minimize risks to life and property in areas of high geologic and flood hazard, would assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs consistent with Coastal Act Section 30253.

C. PERMISSIBLE DEVELOPMENT IN WETLANDS

Section 30233 of the Coastal Act states, in applicable part:

- (a) *The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:*
 - (1) *New or expanded port, energy, and coastal-dependent industrial facilities, including commercial fishing facilities.*
 - (2) *Maintaining existing, or restoring previously dredged, depths in existing navigational channels, turning basins, vessel berthing and mooring areas, and boat launching ramps.*
 - (3) *In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities and the placement of structural pilings for public recreational piers that provide public access and recreational opportunities.*
 - (4) *Incidental public service purposes, including but not limited to, burying cables and pipes or inspection of piers and maintenance of existing intake and outfall lines.*
 - (5) *Mineral extraction, including sand for restoring beaches, except in environmentally sensitive areas.*
 - (6) *Restoration purposes.*
 - (7) *Nature study, aquaculture, or similar resource dependent activities...*

- (c) *In addition to the other provisions of this section, diking, filling, or dredging in existing estuaries and wetlands shall maintain or enhance the functional capacity of the wetland or estuary...*

The proposed installation of large woody debris fish habitat structure constitutes the placement of fill in open coastal waters. Coastal Act Section 30233(a) restricts the Coastal Commission from authorizing a project that includes fill of open coastal waters unless it meets three tests. The first test requires that the proposed activity must fit into one of seven categories of uses enumerated in Coastal Act Section 30233(a). The second test requires that there be no feasible less environmentally damaging alternative. The third test mandates that feasible mitigation measures be provided to minimize the project's adverse environmental effects. The fourth and last test requires that the functional capacity of the wetland or estuary are maintained or enhanced.

Allowable Use Test

The applicants have indicated that pier retention and habitat enhancement project portion of the requested amendment is primarily proposed to protect and enhance fish habitat by protecting existing cold deep-water pool habitat within the aggraded segments of the lower Mad River. As discussed in detail above, the proposed project involves the installation of large woody debris atop and onto the lower portions of the former bridge's footings in such a manner as to sustain the scouring of a deep-water pool formed by the obstruction of the Pier 8 structure in the river's perennial low-flow channel. The project is further intended to enhance the complexity of fish habitat within the Pier 8 reach of the lower Mad River. Of the seven allowable uses of fill under 30233(a) that one which most closely matches the intended function for installation of the large woody debris fish habitat enhancement structure is "restoration purposes." To qualify for this permissible use, the fill of coastal waters being undertaken must demonstrate that "restoration" of some feature would result.

In past permit actions, the Commission has found wetland enhancement projects where the *sole purpose* of the project is to improve wetland habitat values to constitute "restoration purposes" pursuant to Section 30233(a)(6). For example, the Commission concurred with a consistency determination for a wetland enhancement project proposed by the U.S. Fish and Wildlife Service at the Humboldt Bay National Wildlife Refuge (CD-33-92). This project involved dredging, diking, and filling of wetlands to create and enlarge shallow ponds and sloughs and replace water control structures and was approved as a "restoration purpose" under Section 30233(a)(7). Similarly in 2000 and 2001, the Commission approved permits for the California Department of Fish and Game authorizing the excavation of shallow ponds within the Department's Mad River Slough (1-99-063) and Fay Slough (CDP No. 1-00-025) Wildlife Areas for the exclusive purpose of restoration. The Commission approved a permit amendment (CDP No. 1-00-025-A1) in March 2004 for additional restoration work at the Fay Slough Wildlife Area.

Neither the Coastal Act nor the Commission's administrative regulations contain a precise definition of "restoration." The dictionary defines "restoration" in terms of actions that result in returning an article "back to a former position or condition," especially to "an unimpaired or

improved condition.”³ The particular restorative methods and outcomes varying depending upon the subject being restored. For example, the Society for Ecological Restoration defines “ecological restoration” as “the process of intentionally altering a site to establish a defined indigenous, historical eco-system. The goal of the process is to emulate the structure function, diversity, and dynamics of the specified ecosystem.”⁴ However, within the field of “wetland restoration,” the term also applies to actions taken “in a converted or degraded natural wetland that result in the reestablishment of ecological processes, functions, and biotic/abiotic linkages and lead to a *persistent, resilient* system integrated within its landscape,”⁵ that may not necessarily result in a return to historic locations or conditions within the subject wetland area. Similarly, “stream restoration” has been defined to be “re-creating spawning and rearing habitats; removing barriers to migration, and restoring shelter, favorable temperatures, and water quality for the species that evolved in those conditions and therefore will survive in them on their own.”⁶ “River restoration,” by contrast, typically include “the re-creation of meander bends on straightened channels, modification of channel geometry to create habitat for fish, planting banks with riparian vegetation, stabilizing eroding embankments, and creating open channels from streams formerly encased in underground culverts.”⁷

Implicit in all of these varying definitions and distinctions is the understanding that the restoration entails returning something to a prior state. Rivers are dynamic systems in which specific attributes, such as the point bars, pools, and riffles are continually created, altered, and destroyed. Consequently “restoration,” as contrasted with “rehabilitation,” encompasses not only reestablishing certain prior conditions but also *reestablishing the processes that create those conditions*. In addition, most of the varying definitions of restoration imply that the reestablished conditions will persist to some degree, reflecting the homeostatic natural forces that formed and sustained the original conditions before being artificially altered or degraded, and not promptly return to the pre-restored state.

Moreover, any finding that proposed filling constitutes “restoration purposes” must be based, in part, on the assumption that the proposed project will be successful in improving habitat values. Should the project be unsuccessful at increasing and/or enhancing habitat values, or worse, if the proposed diking, filling, and dredging impacts of the project actually result in long term degradation of the habitat, the proposed diking, filling, and dredging would not actually be for “restoration purposes.” These two characteristics are particularly noteworthy to restoration grant program administrators in reviewing funding requests to ensure that the return on the funding investment is maximized and liabilities associated with unwanted side-effects of the project are minimized.

³ Merriam-Webster’s Collegiate Dictionary, Tenth Edition

⁴ “Definitions,” *Society of Ecological Restoration News*, Society for Ecological Restoration; Fall, 1994

⁵ *Position Paper on the Definition of Wetland Restoration*, Society of Wetland Scientists, August 6, 2000

⁶ *Restoring Steams in Cities – A Guide for Planners, Policymakers, and Citizens*, Ann L. Riley, Island Press, 1998.

⁷ *Geomorphology in River Restoration*, Environmental Management, 19:1-15, Matt Kondolf, PhD, 1995

Thus, to ensure that the project achieves its stated habitat enhancement objectives, and therefore be recognized as being for "restoration purposes," the project must demonstrate that: (1) it entails a return to or re-establishment of former habitat conditions for salmonids, the presence of landscape-integrated ecological processes, and/or abiotic/biotic linkages associated with these fish species; (2) there is a reasonable likelihood that the identified improvements in habitat value and diversity will result; and (3) once re-established, it has been designed to provide the desired habitat characteristics in a self-sustaining, persistent fashion independent of the need for repeated maintenance or manipulation to uphold the habitat function.

For the reasons discussed below, the Commission finds that the proposed filling and dredging activities does qualify under Section 30233(a)(6) as an allowable use for filling and dredging of coastal waters and wetlands.

The applicants state that the application currently before the Commission to sustain and enhance scour pool habitat alongside Pier 8 was developed in response to suggestions from NOAA Fisheries and CDFG staff as an example of how the U.S. 101 bridges replacement project could be undertaken on the lower Mad River and not further degrade the habitat and channel dynamics in this portion of the watercourse, frustrate the recovery efforts for the various state and federal-listed threatened and endangered salmonids that inhabit the Mad River, and avoid the creation of a wholly new scour hole at a downriver site, as formerly proposed and required under the original permit, whose successful establishment and continuity as long term fish habitat would be in doubt.

As described in the applicant's application materials, the purported benefits to fish habitat the proposed project would provide entail:

- Conserving the scour dynamics at an existing in-water obstruction through the placement of wooden debris structures intended for diverting the river's laminar flow downward to sustain the relatively deep-water area that has formed around the former bridge footings which currently provides significant cold- and still-water refuge for migrating salmonid and other resident fish species.
- Enhancing the cover and shade around and above the scour hole to maintain its thermal integrity, camouflage the habitat from raptors and other predators, and discourage poaching.

With respect to whether there is a reasonable likelihood that the identified restoration of habitat value and diversity will result, the Commission notes that the Pier 8 scour pool currently experiences significant habitat utilization by anadromous fish species during migratory river runs.⁸ Given this existing condition, and the close involvement of fishery resource habitat specialists in the design of the enhancement structure, the likelihood of continued and sustained use of the pool is seen as a highly probable outcome of the project.

To ensure that the scour pool habitat restoration project is developed as proposed, the Commission attaches **Special Condition No. 21**. This special condition requires that the woody

⁸ D. Free, NOAA Fisheries, pers. comm.

debris be installed on and anchored to the remnant Pier 8 footing in the amount, kind, and orientation proposed by the applicant.

Finally, with regard to whether, once re-established, the enhancement structure has been designed to provide the desired habitat characteristics in a self-sustaining, persistent fashion independent of the need for repeated maintenance or manipulation to uphold the habitat function, the applicant has included provisions for the ongoing monitoring of the structure such that a prompt response to an observed need to repair and maintenance to the structure is undertaken in the interest of ensure the structures ongoing habitat improvement function. To ensure that the proposed monitoring and ongoing repair and maintenance of the enhancement structure is undertaken, the Commission includes new **Special Condition No. 22** requiring monitoring of the subject enhancement structure's ability to functionally sustain the scour hole and assessing its structural integrity, with provisions identified for adaptive management and maintenance as determined to be necessary.

Thus, as conditioned, the project is designed to enhance habitat values for water associated fish and wildlife. Preserving the scour pool dynamics around the base of Pier 8 would maintain a deep-water area where up-river migrating adult fish and sea-bound juveniles could continue to safely hold and rest beyond the reach of avian and mammalian predators between sprints to the spawning areas further upstream or to the ocean, respectively. As proposed, the project includes development that is intended to bring about a return to re-establishment of, former habitat conditions for salmonids, the presence of landscape-integrated ecological processes, and/or abiotic/biotic linkages associated with these fish species. Therefore, the Commission finds that the alleged benefits that would be derived from the proposed pool restoration work have been adequately established; thus, the applicants have demonstrated that the purpose of the proposed pier structure retention and installation of woody debris qualifies as restoration purposes under Section 30233(a)(6).

Alternatives

The Commission must further find that there is no feasible less environmentally damaging alternative to the proposed placement of fill in open coastal waters. The only alternatives identified that would meet the objective of the proposed amended project – to avoid the impacts to fish habitat associated with the demolition of Pier 8 – is the “no project” alternative. The no project alternative would involve full demolition / extrication of Pier 8, as originally authorized, and creation of a new scour pool 100 feet downriver as authorized under the original permit.

Other than for the purposes of removing the effectively inert remnants of the former bridge pier's concrete superstructure from the subsurface environment of the river, little perceivable benefit would be derived from full extrication of the structure as was previously authorized under the original permit. To the contrary, full pier removal would necessitate the destruction of the existing scour pool which provides significant fish habitat as discussed above. To compensate for the loss of the pool habitat as envisioned under the original permitted project, a new scour pool would be created on the river's south bank approximately 100 feet down stream of the replacement bridges.

However, given the complexities of fluvial processes, the certainty of successful establishment of a new scour pool cannot be concluded. The intended location for the compensatory scour pool is in an area of the river which, over the last couple of decades, has started to exhibit characteristics of aggradation that could frustrate maintaining a deep water environment.⁹ Accordingly, multiple efforts may be necessary to develop and sustain deep water habitat at the locale. In addition, initial and repeated entry through the adjoining riparian corridors and into the live waters of the river by heavy mechanized equipment needed to excavate and construct scour hard-point elements, such as deflection logs and boulders, and wing dams, would result in additional impacts to wetlands and water quality.

In comparison, the existing Pier 8 footings have an established history of having formed and sustained scour pool habitat in their immediate vicinity with documented utilization by resident and migratory salmonid species for holding and feeding. While it is anticipated that the foreshortening of the pier by removal of its aerial portions would reduce the amount of fluvial resistance that contributes to the presence of the scour hole at the base of Pier 8, the project includes enhancements to be attached to the pier footing remnants to compensate for such reduced vortex scour.

Thus, taking into consideration the economic, environmental, and technical factors, the no project option is not a feasible less environmentally damaging alternative. Therefore, based on the alternatives analysis above, the Commission concludes that the proposed project is the least environmentally damaging feasible alternative.

Mitigation

The Commission must also ascertain whether feasible mitigation measures have been provided to minimize any adverse environmental effects associated with the filling of coastal waters. In other sections of this report, the Commission has identified feasible mitigation measures that will minimize the adverse environmental effects of the fill associated with the proposed pier retention and scour pool enhancement project. These mitigations measures entail: (a) revisions to Special Condition Nos. 7 and 10 requiring the use of specified source control debris barriers and cleanup Best Management Practices in the demolition of Pier 8 and the construction of the large woody debris fish habitat enhancement structure; and (b) modifications to Special Condition No. 8, requiring the submittal of a final erosion control and revegetation plan for the remediation of all areas disturbed in the course of the pier retention and enhancement work. These Special Conditions will minimize adverse impacts to water quality from the entrainment of demolition and construction debris and sediment from ground disturbed areas that could result from the amended project. Therefore, as conditioned, the Commission finds that feasible mitigation will be provided to minimize all significant adverse impacts associated with the proposed filling of coastal waters.

Functional Capacity

The fourth general limitation set by Section 30233 is that any proposed filling in existing wetlands or estuaries must maintain or enhance the functional capacity of the habitat.

⁹ See Lehre, A., Klein, R., Jager, D., *County of Humboldt Extraction Review Team (CHERT) Historic Analyses of the Mad River: 2004-2007 Update*, February 18, 2009

As discussed above, the conditions of the permit will ensure that the project will not have significant adverse impacts on the riverine or marine resources of the Mad River. The mitigation measures incorporated into the amended project and required by the Special Conditions discussed above will ensure that the enhancements to the scour pool would not adversely affect the functional capacity of the river waters resources. Furthermore, by placing the large woody debris within the river, the aquatic habitat for anadromous fish species such as Chinook and coho salmon and steelhead will be enhanced. This habitat restoration would also provide cover and substrate for other aquatic organisms such as macro-invertebrates and algae on which these fish species feed. Therefore, the Commission finds that the project, as conditioned, will maintain and enhance the biological productivity and functional capacity of the habitat consistent with the requirements of Section 30233 of the Coastal Act.

D. COASTAL WATER QUALITY

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.

The proposed amendments to the project to retain and/or enhance portions of Piers 6, 8, and 9 have the potential to impact the aquatic biological resources and the quality of coastal waters in ways not previously reviewed and considered in the review and conditional approval of the original project permit. With respect to the proposed termination of demolition of the Pier 6 and 9 footings at one meter below ordinary ground level, no specifications for such partial retention was included in the criteria for construction performance standards, revegetation and erosion and control, and water quality pollution protection plans as imposed by Special Condition Nos. 7, 8, or 10 in the original permit

Notwithstanding the significantly reduced scale of the originally envisioned full removal of the piers, if not properly graded and revegetated, avoidable impacts to coastal resources could result. In addition, the proposed partial demolition of the aerial portions of Pier 8 and the construction of the deep water fish habitat enhancement structure could similarly impact aquatic resources from the uncontrolled release of construction debris, including concrete-water slurry, and scrap metal and wood associated with the large woody debris attachment hardware.

Thus, to ensure ongoing compliance with Coastal Act Section 30231, the Commission modifies the construction responsibilities provisions of Special Condition Nos. 7 and 10, and adds new Special Condition No. 23 to require that: (1) upon the completion of the Pier 6 and 9 demolition to one meter (1 m.) below ordinary ground level, the excavation be back-filled with clean

material matching the composition and compaction of surrounding soil and earthen materials, to an elevation and slope matching that of the surrounding terrain; (2) the Pier 8 demolition work be limited to: (a) wire saw cutting of the aerial portion of the pier to as close to the Ordinary Low Water (OLW) summer flow water surface elevation as possible; and (b) additional demolition by pneumatic jack hammers of the remaining portion of the concrete column necessary to stabilize the logs used in the large wood debris habitat enhancement feature; (3) prior to removal of the pier column, an impermeable membrane material (such as a rubber pond liner) shall be secured and sealed around the column just below the OLW saw cut elevation; (4) the membrane shall be formed into a basin around the perimeter of the column to allow water and cutting slurry generated from the concrete cutting operation to be collected in the basin and pumped into a portable water tank for disposal at an offsite location, consistent with the approved water quality protection plan; (5) construction of the Pier 8 scour hole fish habitat enhancement structure shall employ water quality Best Management Practices (BMPs), such as catch tarps, and vacuum cleaning, during the drilling of holes into both the wooden debris members and the pier concrete to prevent boring wastes from entering coastal waters; and (6) a revised final revegetation and erosion control plan for the amended project by submittal for the review and approval of the Executive Director.

With the specified revisions to the special conditions imposed to the original permit approval, 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 Condition Nos. 7 and 10, and new Special Condition No. 23, is consistent with Section 30231 of the Coastal Act.

E. 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 site around the existing bridge pier being closed off for the staging and routing of construction equipment, the construction work would not significantly obstruct shoreline or in-water access in the vicinity of the Mad River Bridges. Although there may be limited and temporary restrictions on boating activity during installation of the new enhancement structure, these impacts are only of a temporary duration that will have no long-term impact on access. The project work would span an approximate four-week timeframe and be undertaken between mid-August and October 1, a relatively low-use time of year for anglers prior to the start of the fall runs of Chinook salmon. Therefore, the Commission finds that the proposed project as conditioned, which does not include substantial new public access, is consistent with the public access policies of the Coastal Act.

F. VISUAL RESOURCES

Section 30251 of the Coastal Act states:

The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas. New development in highly scenic areas such as those designated in the California Coastline Preservation and Recreation Plan prepared by the Department of Parks and Recreation and by local government shall be subordinate to the character of its setting.

The banks of the Mad River on both sides of the proposed Pier 8 scour pool enhancement project contain mature willows, alder, cottonwoods and water birch. Many of these trees are of specimen size and have fully developed understory vegetation. These trees form an overhanging canopy for the riparian corridor that provides shade and important fish habitat along the river. The intent of the scour pool enhancement project is to further improve these conditions in the immediate vicinity of Pier 8 by the installation of an array of logs and root wads on the upper portion of the pier's footings. Mechanical anchors including bolts, cables, and steel dowels may also be used where needed to attach the woody debris to the footings. These fasteners are proposed to be installed to be hidden from view as much as possible. Once installed, the enhancement structure would approximate the appearance of a naturally occurring lodged raft of wooden debris, similar to that found at other nearby locations along the river shoreline. Notwithstanding the natural materials appearance of the large woody debris improvements, temporary visual resource impacts would occur during construction of the Pier 8 scour pool fish habitat enhancement structure due to demolition of the piers aerial portions, removal of vegetation and other debris around the pier, and the presence of equipment in the construction and staging areas. To ensure that these impacts are short-term and that long term restoration will occur, the Commission includes new Special Condition 23 to require that, prior to issuance of the permit amendment, a revised final revegetation and erosion control plan be submitted for the review and approval of Executive Director, specifying re-planting of the affected surrounding construction and staging areas with locally obtained, native plant materials.

The Commission finds that as the proposed scour pool fish enhancement project, as conditioned, is consistent with Coastal Act Section 30251 concerning the protection of visual resources.

G. CALIFORNIA ENVIRONMENTAL QUALITY ACT

On June 17, 2005, Caltrans as lead agency, certified Mitigated Negative Declaration (SCH 2003122015) for the subject Mad River Bridges Replacement Project," which incorporated the published responses of Caltrans to public comments.

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. 1-07-014 (Caltrans)