HILL ROAD BRIDGE AT MILL CREEK BRIDGE REPLACEMENT PROJECT

PUBLIC DRAFT
Initial Study/Proposed Mitigated Negative Declaration

Prepared for:

340 Lake Mendocino Drive
Ukiah, California 95482

Prepared by:

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August 12, 2020

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1. Project Information

1. Project Title	Hill Road at Mill Creek Bridge Replacement Project
2. Lead Agency Name & Address	County of Mendocino Department of Transportation 340 Lake Mendocino Drive Ukiah, California 95482
3. Contact Person & Information	Chris Collins Telephone number: (707) 234-2818 Email: collinsch@mendocinocounty.org
4. Project Location	The project is located at the southeast edge of Round Valley, approximately 3.25 miles southeast of the Town of Covelo in northeastern unincorporated Mendocino County. The specific location of the project is where Hill Road crosses Mill Creek, approximately 1.5 miles east of the intersection of Hill Road and Dobie Lane, at Mile Post 2.05. The project site is located within the Jamison Ridge 7.5 minute USGS quadrangle, Township 22N, Range 12W, Section 22, Latitude 39.7491N, Longitude 123.1814W.
5. Project Sponsor's Name & Address	The Project will be implemented by the Mendocino County Department of Transportation and is a federally funded Highway Bridge Program (HBP) project.
6. General Plan Designation	Parcels surrounding the roadway and bridge are classified as Remote Residential 20 (20 acres)
8. Zoning	Parcels surrounding the roadway and bridge are zoned Upland Residential (U-R), with Flood Plain (FP) combining zone.
9. Description of Project	Replace the existing single-lane Hill Road bridge over Mill Creek with a new two-lane bridge, widened roadway approaches, and creek bank stabilization.
10. Surrounding Land Uses and Setting	Round Valley to the west of the project site is primarily devoted to agriculture and rural residential homes. To the north, south, and east is rangeland and forest, including the Mendocino National Forest to the east.

1.1 Project Location and Setting

The Project is located approximately 3.25 miles southeast of the Town of Covelo in northeastern unincorporated Mendocino County (see Figure 1, Vicinity Map). The Project area is accessed regionally by State Route 162, which is located approximately 3.5 miles west of the Project area. The specific location of the project is where Hill Road crosses Mill Creek, approximately 1.5 miles east of the intersection of Hill Road and Dobie Lane.

The existing bridge (Caltrans Bridge No. 10C0111) was constructed in 1925 and is a single-lane, single-span, through-truss bridge 120 feet in length and 18 feet wide with a wood deck. The existing roadway approaches on either side of the bridge narrow from approximately 20-feet wide (two 10-foot lanes) to 13-feet wide at the bridge. Private driveway approaches are located on either side of the bridge (see Figure 2, Project Site Map). Views of the existing bridge, creek, and roadway approaches are provided Figure 3, Views of Existing Bridge.

The existing bridge provides access across Mill Creek, which is a tributary to the Middle Fork Eel River. Mill Creek flows southeasterly, entering the Middle Fork Eel River about 2.25 miles east of the bridge. The stream corridor in the Project area supports a riparian area comprised primarily of oak, alder, and willow, as well as grasses and shrubs. Several salmonid surveys have been performed in Mill Creek from as early as 1938, and the creek is known to support steelhead (*Oncorhynchus mykiss*).

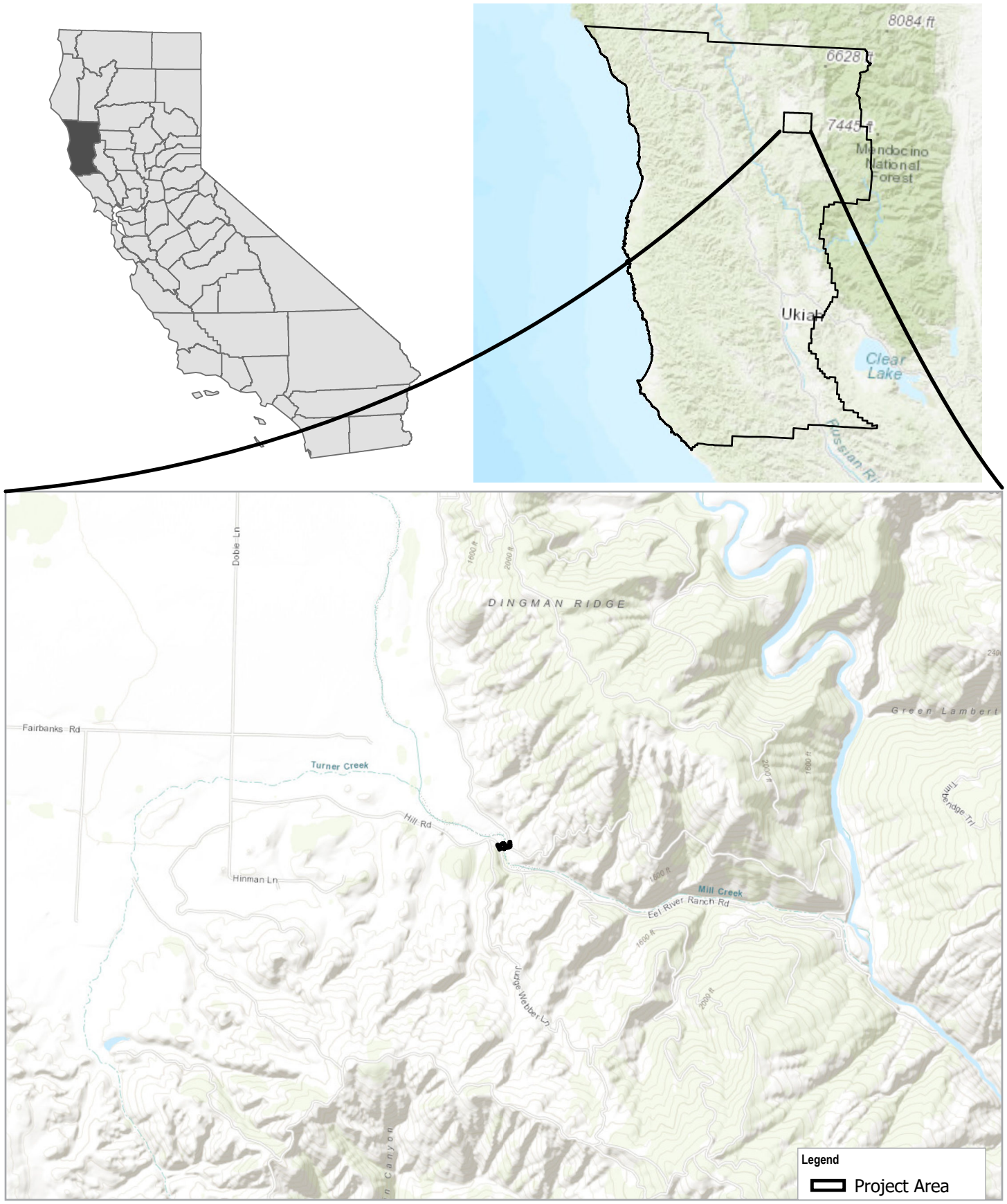
United States Geological Survey (USGS) stream gage No. 11473700 (since abandoned) was located just downstream of the project site and acquired data from 1956 to 1971. The watershed and gage was part of the USGS investigation "Magnitude and Frequency of Floods in California", so although the location has not received a detailed study from FEMA for flood insurance purposes, the watershed and flow has received significant study and analysis by USGS. USGS gage data shows little or no flow during August, September, and October (GHD 2020).

1.2 Project Background

The Mendocino County Department of Transportation (MDOT), in coordination with the California Department of Transportation (Caltrans) originally proposed the Hill Road Bridge at Mill Creek Replacement Project in 2012. The original Area of Potential Effects (APE) was approved and signed by Caltrans on September 18, 2012. However, the Project was put on hold to address several geotechnical design elements. In 2016, an additional 0.53-acre area was added to the original APE in order to accommodate the updated bridge design. Caltrans approved the change in 2017. Below is the full project description of the improved replacement bridge design.

1.3 Proposed Project

The existing bridge has been determined by Caltrans to be structurally deficient. The proposed project would replace the existing single-lane bridge with a new two-lane bridge and widened roadway approaches. The new bridge would be approximately 147 feet long and 27 feet wide, which would be 27 feet longer and 9 feet wider than the existing bridge. The horizontal alignment of the new bridge would match that of the existing bridge, which is approximately perpendicular to the normal stream alignment of Mill Creek. The new bridge would be similar in character to the existing bridge, namely a single-span, steel truss structure (see Figure 3, Views of Existing Bridge). In addition to the new bridge, approximately 200-foot section of the eastern roadway approach and 300 feet of the western approach prior to the bridge would be improved with two 10-foot wide travel lanes with 2-foot wide shoulders to accommodate the new bridge deck elevation, width and location.



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Hill Road Bridge at Mill Creek
Bridge Replacement Project

Project No. **1073712001**
Revision No. **-**
Date **July 2020**

Vicinity Map

FIGURE 1

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Data source: World_Topo_Map: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community. Created by: jclark2



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Map Projection: Lambert Conformal Conic
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Project Site Map

FIGURE 2

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View of bridge and roadway approach looking west.



View of bridge and creek looking south.

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As part of the proposed project, the existing bridge abutments would be removed and the bank smoothed to match the existing bank slopes, or to a maximum 2:1 slope. The abutments supporting the new bridge would be installed behind the existing abutments and further up the channel bank. This would effectively widen the opening at the bridge by approximately 20 feet on the west bank and 10 feet on the east bank. Creek banks would be re-contoured to match the existing bank slopes, excepting for the bridge abutments. After obtaining the engineered grade of the channel banks, rock slope protection (RSP) would be placed to armor and protect the channel banks from potential erosion. There would be a permanent placement of approximately 5,700 square feet of RSP: approximately 3,100 square feet on the west bank and 2,600 square feet on the east bank.

Property Acquisition and Easements

It is anticipated that fee-title acquisition of right-of-way would be required from approximately four parcels that border the Project site. Temporary construction easements would also be required from approximately four parcels that border the Project site. A listing of parcels affected by property acquisition and easements is provided below. The permanent right-of-way that would be acquired as part of the Project amounts to approximately 5,846 square feet (0.13 acres) and the temporary construction easements amount to approximately 17,204 square feet (0.39 acres) (Table PD-1).

Table PD-1: Overview of Property Acquisitions and Temporary Construction Easements

Assessor's Parcel Number	Temporary Construction Easement (Square Feet)	Right-of-Way Acquisition (Square Feet)
034-300-36	264	N/A
034-300-30	6,865	1,026
034-300-31	3,227	3,420
034-300-39	6,848	1,400
Total	17,204 (0.39 acre)	5,846 (0.13 acre)

1.4 Project Construction Activities

Construction is anticipated to begin in March 2024 and continue through November 2024. The project would be conducted during one construction season and take approximately eight months to complete. The total construction disturbance area is estimated to be 0.9 acres (see Figure 4, Area of Potential Effect Map). Project construction would be restricted to daytime hours.

Roadway Closure

The existing bridge crossing would be closed to vehicles throughout the duration of construction. Emergency responders would be notified in advance of closure dates. In order to access State Route 162, residences located adjacent to the Project area on the east side of the bridge would temporarily be required to proceed north along Hill Road for 3.25 miles, then west on East Lane for another 3.25 miles. Residences located in the Project area on the west side of the bridge could continue to use their normal route to State Route 162 (for example, Hill Road to Dobie Lane to Fairbanks Lane). See Figure 5, Temporary Detour Routes.

Bridge Demolition and Construction

Before the new bridge is constructed, the existing bridge would be dismantled. Construction equipment, including cranes, excavators, jack hammers, and shovels would be used to break-up and remove the existing concrete abutments, headwalls, and associated footings from the creek. Existing concrete piles would be cut below grade and left in place.

Demolition waste would be stockpiled and sorted outside of the creek channel and then loaded for disposal or recycling at appropriate off-site facilities. The truss super-structure would remain County property and would be hauled to a County Corporation Yard located in Ukiah. Demolition materials with no practical reuse or that cannot be salvaged or recycled would be disposed of at a landfill, most likely the Potrero Hills Landfill in Solano County, which accepts solid waste from Mendocino County. A temporary access road would be constructed along the gravel bar located along the side of the creek to accommodate construction, including pile driving and pouring of new concrete bridge abutments and headwalls. Steel piles at each new bridge support would be driven below the potential scour line of the streambed of Mill Creek. Pile driving activities would be out of the creek channel, set back from the creek. It is anticipated that pile driving would occur at the west abutment, as well as the west abutment wing walls (retaining walls). Piles at the east abutment would be installed using cast-in-drilled-hole (CIDH) construction method, whereby a borehole is drilled into the ground and then filled with concrete and reinforcing. Construction of each abutment is described below:

East Abutment. 24-inch diameter CIDH piles would be drilled approximately 36 feet below ground surface. The east abutment wing walls/retaining walls would use 24-inch diameter CIDH piers that are approximately 30-feet in length. In total, it is assumed that twenty-two (22) piles would be placed at the east abutment.

West Abutment. 16-inch diameter pipe piles would be driven approximately 54-feet below ground surface. The west abutment wing walls/retaining walls would use 16-inch diameter cast-in-steel-shell (CISS) piles. In total, it is assumed that twenty-eight (28) piles would be placed at the west abutment.

Once the concrete is cured and the piles are in place, a crane would be used to set a new prefabricated steel structure in place. After the steel structure is set in place, the reinforcing rebar for the deck and curb would be placed, and the concrete for the surface would be poured.

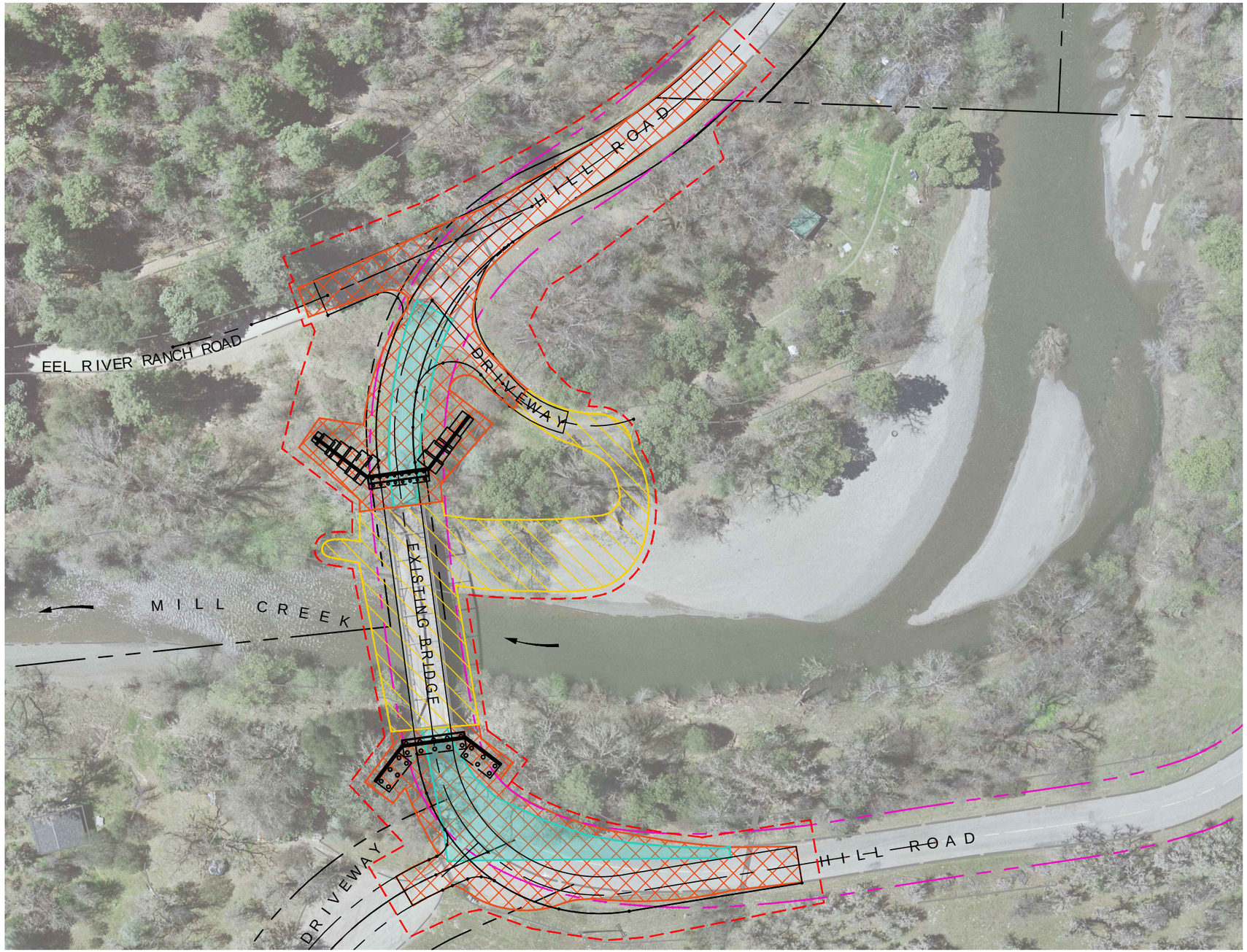
Dewatering

Construction activities within the banks of Mill Creek would be performed between June 15 and October 15, which would correspond to times when there is little or no precipitation and when stream flow would be lowest. If there is no flow during the construction period (typical of late summer/early fall most years), diversion would be unnecessary.

If water is present in the channel between June and October, the construction area would be dewatered by diverting the flow using one of the following methods: placing sandbags; installing two sets of k-rails and a rubber lining; installing super sacks; or, installing sheetpiles along the construction area to allow low flow to continue through the construction area. The type of method to be implemented would depend on the contractor's preference and the amount of flow present. If flow is shallow, sand bags can be placed along the construction area. If there is a greater amount of flow present then the k-rail, super sack, or sheetpile diversion method could be implemented. Dewatering would be conducted in accordance with the Caltrans Field Guide to Construction Site Dewatering Manual and Standard Specification Section 13-4.03G.

LEGEND

- AREA OF PERMANENT IMPACT
- AREA OF TEMPORARY DISTURBANCE
- POTENTIAL STAGING AREA
- APPROXIMATE RIGHT OF WAY
- ARCHAEOLOGICAL AND ARCHITECTURAL AREA OF POTENTIAL EFFECT



N

SCALE

0’ 60’ 120’ 180’

1” = 60’

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Bridge Replacement Project

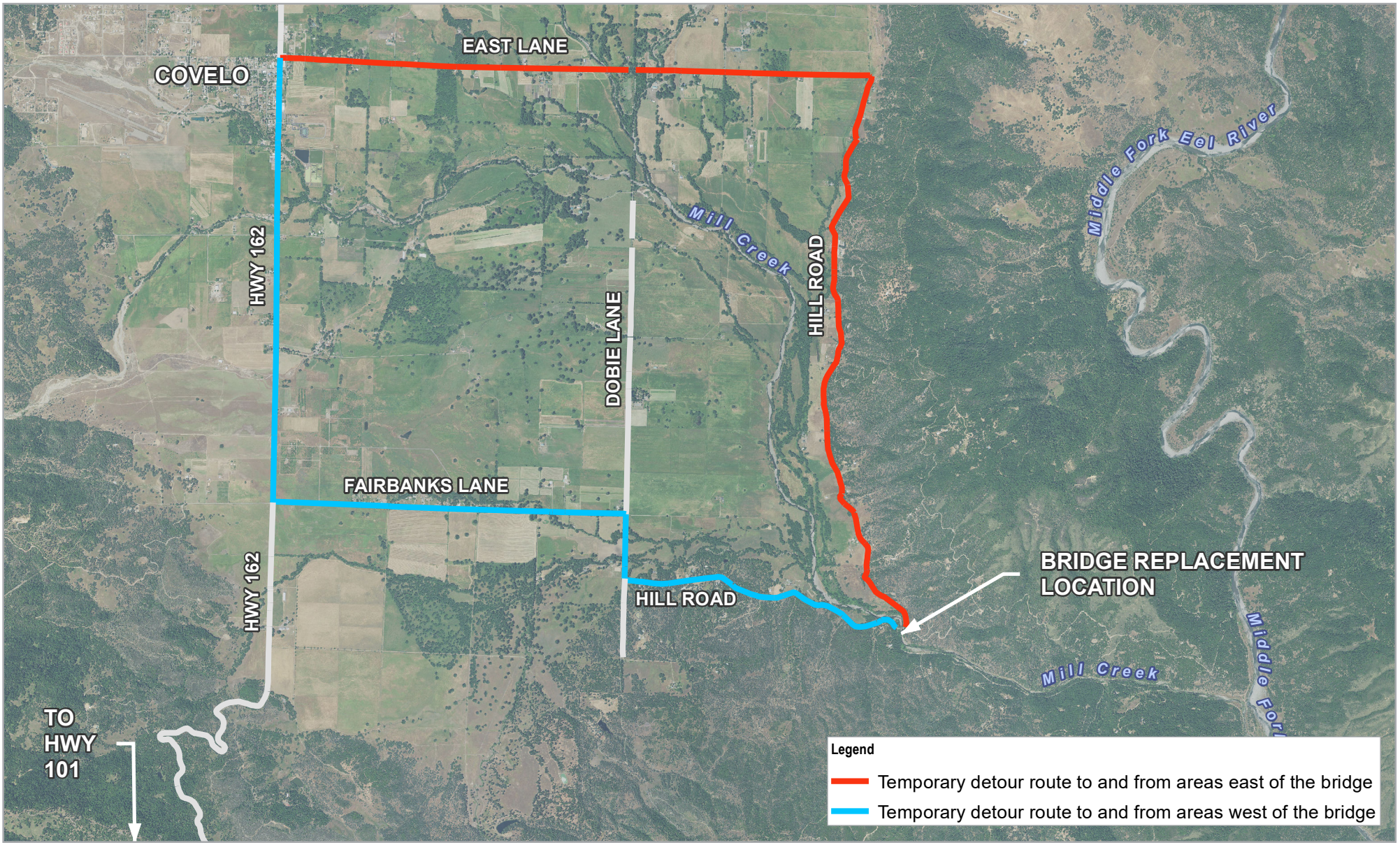
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Revision A
Date July 2016

Area of Potential Effect (APE) Map

Figure 4

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Miles

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Grid: NAD 1983 StatePlane California II FIPS 0402 Feet

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Temporary Detour Routes

FIGURE 5

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Sandbags If minimal water is present within the channel, sandbags can be placed around the construction area to ensure no water within the project site.

K-Rails Under implementation of the k-rail diversion technique, the channel bottom would need to be excavated so a rubber lining can be installed. The rubber lining would need to lie flat along the bottom of the channel. Then two rows of k-rails will be installed parallel to the creek banks to hold the lining in place and keep the flow away from the construction activities. Additional gravel would be placed on the lining to provide habitat for amphibians as well as passage for fish species.

Super Sacks Under implementation of the super sacks, excavation would need to occur to place a plastic lining along the channel bottom. The plastic lining would need to lie flat along the bottom of the channel, and then two large sacks filled with rock would be positioned along each creek bank. Additional gravel would be placed on the lining to provide habitat for amphibians as well as passage for fish species.

Sheetpiles Under implementation of the sheetpile diversion method, temporary sheetpiles will be advanced or pushed into the sediments using non-vibratory methods along both creek banks.

Upon Project completion, the dewatering method will be removed from the channel. All four dewatering methods would result in various levels of disturbance. The K-Rail dewatering method is anticipated to require the greatest level of disturbance and therefore, is the dewatering method analyzed below.

Native Aquatic Species Relocation

For all methods of diversion, or if a remnant pool is present in the work area with no flow and no connection to other standing water, block nets would first be placed at each end of the construction area and qualified biologists would capture and relocate any native fish or other native aquatic species present in the reach to be dewatered. All fish located within the construction area immediately prior to or during dewatering will be captured by seine, dip net, and/or electrofisher and removed by qualified biologists pre-approved by NMFS.

A qualified biologists would stand by during and observe dewatering to relocate native aquatic organisms. Once dewatering is implemented and flow is diverted away from the construction area, a biologist would be present for the duration the dewatering method is required and any standing water would be observed for fish.

Revegetation

Construction would require removal of approximately 30 trees (alder, willow, and oaks), as well as grasses and shrubs. The majority of the trees to be removed have tree trunk diameters less than 4-inches wide, although four of the trees have diameters greater than 12 inches. Construction-related disturbance in blue oak woodland and black willow thickets would be limited to the extent practicable.

Once the new bridge and RSP is complete, exposed and disturbed areas of the creek bank and construction area would be seeded and mulched. Non-invasive plants would be used for revegetation along with commercial hydraulic mulching materials. Disturbed areas will be re-vegetated with fast-growing native plants, including locally-sourced willow cuttings, along with commercial hydraulic mulching materials upon completion of work. Application quantities for mulching would be provided in accordance with the Caltrans Standard Specifications for erosion control (Caltrans 2018a).

Staging and Construction Workers

During construction, a temporary staging area would be established within the roadway on either side of the creek. The staging area would be used for delivery and storage of construction materials, for fueling and maintenance of equipment, for contractor parking, and stockpiling materials. The types of construction equipment that would likely be used during construction are listed in Table PD-2, Construction Equipment. Pile driving may use impact hammers. The project would not use vibratory hammers, oscillators, or rotators for pile driving, in accordance with Caltrans' 2018 Standard Specification Section 49-2.01C(2) which prohibits the use of that equipment to install driven piles. Stockpiles would also be managed in accordance with Caltrans' 2018 Standard Specification Section 13-4.03C(3).

The number of construction-related vehicles traveling to and from the Project site would vary on a daily basis. For the purpose of analysis, it is assumed that the peak number of trucks expected on any one day would be approximately 8 one-way truck trips per hour, or 64 one-way haul truck trips per day. In addition to haul truck traffic, an average of 40 one-way vehicle trips per day is estimated for the construction crew.

Table PD-2. Construction Equipment

Typical Equipment	Number
Excavator	1
Front-end Loader	1
Bulldozer	1
Crane	1
Dump Trucks	1
Grader	1
Asphalt Paver	1
Rollers	1
Impact Hammer	1

1.5 Other Public Agencies Whose Approval is Required

Public agencies whose approval is required for project implementation include, but would not be limited to:

North Coast Regional Water Quality Control Board – 401 Water Quality Certification for in-stream work subject to the Clean Water Act.

California Department of Fish and Game – 1600 Streambed and Lake Alteration Agreement for certain portions of project implementation within DFG jurisdiction.

State Water Resources Control Board – Storm Water NPDES permits as required for construction projects in excess of 1 acre total disturbed soil area.

US Army Corps of Engineers – Clean Water Act Section 404 Permit for discharges to jurisdictional waters of the United States.

National Marine Fisheries Service – Will review impacts to and protections for salmonids, listed species under the Endangered Species Act, and likely present at the project site.

United States Fish and Wildlife Service – Will review impacts to and protections for plants and terrestrial wildlife species under the Endangered Species Act.

Mendocino County Board of Supervisors – Adoption of Resolution supporting a Negative Declaration pursuant to CEQA for the project.

1.6 CEQA Requirements

This Project is subject to the requirements of the California Environmental Quality Act (CEQA). The CEQA lead agency is the County of Mendocino. Prior to making a decision to approve the Project, the County must identify and document the potential significant environmental effects of the Project in accordance with CEQA. This IS/Proposed MND has been prepared under the direction of the County to fulfill the CEQA requirements.

The purpose of this Initial Study is to provide a basis for deciding whether to prepare an Environmental Impact Report, a Mitigated Negative Declaration or a Negative Declaration. This IS/Proposed MND is intended to satisfy the requirements of the CEQA (Public Resources Code, Div 13, Sec 21000-21177), and the State CEQA Guidelines (California Code of Regulations, Title 14, Sec 15000-15387). CEQA encourages lead agencies and applicants to modify their projects to avoid significant adverse impacts.

Section 15063(d) of the State CEQA Guidelines states the content requirements of an Initial Study as follows:

> 15063(d) Contents. An Initial Study shall contain in brief form:
>
> (1) A description of the Project including the location of the Project;
>
> (2) An identification of the environmental setting;
>
> (3) An identification of environmental effects by use of a checklist, matrix, or other method, provided that entries on a checklist or other form are briefly explained to indicate that there is some evidence to support the entries;
>
> (4) A discussion of the ways to mitigate the significant effects identified, if any;
>
> (5) An examination of whether the Project would be consistent with existing zoning, plans, and other applicable land use controls;
>
> (6) The name of the person or persons who prepared or participated in the Initial Study.

2. Determination

The environmental factors checked below would be potentially affected by this Project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Agriculture Resources	☒ Air Quality
☒ Biological Resources	☒ Cultural Resources	☐ Energy
☒ Geology /Soils	☐ Greenhouse Gas Emissions	☒ Hazards & Hazardous Materials
☒ Hydrology / Water Quality	☐ Land Use / Planning	☐ Mineral Resources
☒ Noise	☐ Population / Housing	☐ Public Services
☐ Recreation	☐ Transportation/Traffic	☐ Tribal Cultural Resources
☐ Utilities / Service Systems	☐ Wildfire	
☒ Mandatory Findings of Significance		

On the basis of this initial evaluation:

☐ I find that the proposed Project COULD NOT have a significant effect on the environment and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed Project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the Project have been made by or agreed to by the Project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed Project MAY have a “potentially significant impact” or “potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed Project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an EARLIER EIR or NEGATIVE DECLARATION pursuant to applicable legal standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed Project, nothing further is required.

Chris Collins _____ August 12, 2020

Chris Collins
County of Mendocino Department of Transportation

Date

3. Environmental Analysis

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
I. Aesthetics				
Except as provided in Public Resources Code Section 21099, would the Project:				
a. Have a substantial adverse effect on a scenic vista?				✓
b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?				✓
c. Substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?			✓	
d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?				✓

Discussion:

I. a) Adverse Effect on a Scenic Vista – No Impact

The Mendocino County General Plan does not designate any scenic vistas in the vicinity of the Project site (Mendocino County 2009). In addition, implementation of the Project would not result in comparably different views from the existing condition. No impact would occur.

I. b) Damage Resources with a State Scenic Highway – No Impact

There are no officially designated state scenic highways in Mendocino County (Caltrans 2018b). State Route 1 and State Route 20 in Mendocino County are listed as “eligible” for designation as scenic highways; however, these highways are not located within the area of the Project site. No impact would occur.

I. c) Degrade Existing Visual Character – Less than Significant

The project is not located in an urbanized area. Construction could result in short-term effects on the visual character and quality of the Project area typical of construction activities. For example, construction activities would result in temporary ground disturbance, landscape alterations, construction staging areas and the presence of construction vehicles that would be visible. Exposed and disturbed areas of the creek bank and construction area would be re-seeded and mulched, and new vegetation would be replanted. Therefore, because construction related affects would be temporary and typical of construction activities, the temporary impact on visual character and quality would be less than significant.

Following construction, the appearance of the Project area would not be substantially different from the existing views of the area. The visual character and quality of the site would remain similar to existing conditions. The new bridge would be a single-span, through-truss structure, similar to the existing bridge, and the horizontal alignment of the new bridge would match that of the existing bridge. The presence of rock slope protection would be confined to the area beneath the bridge footings and would not be visually obtrusive. The new bridge would not dramatically alter the visual character of the site or obstruct any views. The impact would be less than significant.

I. d) New Source of Light or Glare – No Impact

Project construction would not include nighttime work. Therefore, construction activities would not result in a source of substantial light that would adversely affect nighttime views in the area. In addition, considering the nature of construction activities, equipment, and materials, there would be very little, if any, glare resulting from the Project. The only potential for Project-related glare would be from reflective surfaces (e.g., windshields) on construction equipment as they carry out construction activities. However, these instances of glare would be momentary and passing, depending on sky conditions, and the impact on daytime views in the area would be less than significant.

Following construction, the Project would not include new sources of daytime glare or change nighttime lighting and illumination levels in the area. No lighting is proposed, and centerline and fog line striping would not produce glare in amounts that would adversely affect day or nighttime views. No impact would occur.

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
II. Agriculture and Forest Resources				
Would the Project: (In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.)				
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				✓
b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?				✓
c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?				✓
d. Result in the loss of forest land or conversion of forest land to non-forest use?				✓
e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?				✓

Discussion:

II. a) Convert Farmland – No Impact

According to mapping compiled by the California Department of Conservation (CDC), Division of Land Resource Protection, the Project site is located in an area mapped as "Grazing Land" (CDC 2016). The Project site is not located on land mapped as prime farmland, unique farmland, or farmland of statewide or local importance. No impact would occur.

II. b, c & d) Conflict with Existing Zoning or Williamson Act Contract – No Impact

According to the Mendocino County Zoning Ordinance, the lands surrounding the Project area are zoned as Upland Residential. The Upland Residential District is described as being intended to create and enhance farming and low-density agricultural/residential uses. The Zoning Ordinance states that typically the Upland Residential District would be applied to non-prime production lands which have constraints to commercial agriculture, timber production or grazing, but which are absent of such limitations as inadequate access, unacceptable hazard exposure, or incompatibility with adjoining resource lands.

Although the Zoning Ordinance identifies low-density agriculture, limited forest production, and processing as a permitted uses in an Upland Residential District, no land in the Project area is either zoned specially for agriculture or forest land or meets the definition of forest land. The Project would be consistent with zoning designations and would not cause a change in land use patterns, as the Project would consist of an in-kind replacement of an existing public structure involving negligible or no expansion of use. Neither construction nor operation of the Project would conflict with zoning regulations for agricultural use, forest land, result in the loss of forest land, or result in the conversion of forest land to non-forest use. Additionally, the Project site is not located on land enrolled in Williamson Act contracts (CDC 2017). No impact would occur.

II. e) Convert Farm or Forest Land – No Impact

The Project would consist of an in-kind replacement of an existing public structure involving negligible or no expansion of use. The Project would not cause, or is intended to cause, a change in land use patterns which would convert farmlands or forestlands. The Project would have no impact on conversion of farmland or forest land to non-agricultural or non-forest use.

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
III. Air Quality				
Would the Project: (Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations.)				
a. Conflict with or obstruct implementation of the applicable air quality plan?		✓		
b. Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is nonattainment under an applicable federal or state ambient air quality standard?			✓	
c. Expose sensitive receptors to substantial pollutant concentrations?			✓	
d. Result in other emissions (such as those leading to odors adversely affecting a substantial number of people?				✓

Discussion:

The Project site is located within the Inland Rural Mendocino County sub-basin of the North Coast Air Basin, which is within the jurisdiction of the Mendocino County Air Quality Management District (MCAQMD). The Inland Rural Mendocino County sub-basin, like the rest of Mendocino County, is designated as a non-attainment area for the State particulate matter (PM_{10}) standard (ARB 2017). The sub-basin is in attainment for all other State standards and for all Federal criteria air pollutants (ARB 2017, U.S. EPA 2018).

According to the MCAQMD's Particulate Matter Attainment Plan (MCAQMD 2005), the primary man-made sources of PM_{10} pollution in the North Coast Air Basin are wood combustion (woodstoves, fireplaces and outdoor burning), fugitive dust, and automobile traffic. Some of the automobile emissions are the result of "pass-though" traffic on US Highway 101 because of its nature as the major transportation corridor in this part of the State.

CEQA Thresholds

On June 3, 2010, the MCAQMD Air Pollution Control Officer issued new CEQA guidance which requested that Planning agencies and consultants use the Bay Area Air Quality Management District (BAAQMD) CEQA Thresholds adopted on May 28th, 2010, to evaluate air quality impacts, with clarifications provided in 2013(MCAQMD 2010, MCAQMD 2013). The BAAQMD thresholds have subsequently been updated, with the last major revision completed in May 2017.

The BAAQMD CEQA Thresholds were subsequently invalidated by a trial court because the BAAQMD itself did not do a CEQA evaluation of the Thresholds before their adoption. The Court, however, did not rule on or question the adequacy of the BAAQMD Air Quality CEQA Guidelines, including the impact assessment methodologies, or the evidentiary basis supporting the Thresholds, which are included in the Guidelines.

Therefore, the following air quality analysis utilizes in part the impact assessment methodologies presented in the BAAQMD Air Quality CEQA Guidelines.

III. a) Conflict with or Obstruct Applicable Air Quality Plan – Less than Significant with Mitigation

The California Clean Air Act of 1988 requires that any air district that does not meet the PM_{10} standard make continuing progress to attain the standard at the earliest practicable date. In response to this requirement, the MCAQMD adopted a Particulate Matter Attainment Plan in 2005 (MCAQMD 2005), which includes a description of local air quality, the sources of local PM emissions, and recommended control measures to reduce future PM levels. Control measures recommended in the Attainment Plan include measures related to woodstoves, campgrounds, unpaved roads, construction and grading activities, new residential development, and open burning emissions.

Construction activities associated with the Project would include site preparation (e.g., demolition, clearing/grubbing), grading, excavation, bridge construction, and asphalt paving. The types of air pollutants generated by these activities are typically nitrogen oxides and particulate matter, such as dust and exhaust. Because construction activities could temporarily increase levels of PM_{10} in a region designated as non-attainment for PM_{10}, the impact is considered significant.

Mitigation Measure AQ-1: Dust Control Measures

In accordance with Rule 1-430(b) of the Mendocino County Air Quality Management District Regulations, the County of Mendocino and its Contractor shall implement the following airborne dust control measures during construction activities:

- All visibly dry disturbed soil road surfaces shall be watered to minimize fugitive dust emissions.
- All unpaved surfaces, unless otherwise treated with suitable chemicals or oils, shall have a posted speed limit of 10 miles per hour.
- Earth or other material that has been transported by trucking or earth moving equipment, erosion by water, or other means onto paved streets shall be promptly removed.
- Asphalt, oil, water, or suitable chemicals shall be applied on materials stockpiles and other surfaces that can give rise to airborne dusts.
- All earthmoving activities shall cease when sustained winds exceed 15 miles per hour.
- The operator shall take reasonable precautions to prevent the entry of unauthorized vehicles onto the site during non-work hours.
- The operator shall keep a daily log of activities to control fugitive dust.

With implementation of Mitigation Measure AQ-1, construction activities would not conflict with or obstruct implementation of the 2005 Particulate Matter Attainment Plan. The impact following mitigation would be less than significant.

III. b) Result in Cumulatively Considerable Net Increase of Any Criteria Pollutant for which the Region is in Non-Attainment – Less than Significant Impact

The Project site is located in an area that is in attainment for all criteria air pollutants, except for PM_{10}. By its nature, air pollution is largely a cumulative impact, in that individual projects are rarely sufficient in size

to result in nonattainment of ambient air quality standards. Instead, a project's individual emissions may contribute to cumulative adverse air quality impacts.

The BAAQMD's CEQA guidelines and thresholds, which the MCAQMD uses as CEQA guidance, includes screening criteria to provide lead agencies with a conservative indication of whether a Project could result in potentially significant air quality impacts. According to the guidelines, if a project's characteristics (i.e., square footage, acreage, number of dwelling units) are less than associated screening criteria, then the lead agency does not need to perform a detailed air quality assessment of the Project's air pollutant emissions and a less-than-significant impact would occur (BAAQMD 2017).

For construction activities, several different screening criterions are recommended by the BAAQMD relative to air pollutant emissions (i.e., reactive organic gases [ROG], NO_X, $PM_{2.5}$, and PM_{10}). For example, detailed air quality assessments are not required for construction of projects such as single family residential developments comprised of less than 114 dwelling units, City parks that are less than 67 acres in size, and construction of office and commercial buildings that are less than 277,000 square feet (BAAQMD 2017).

The BAAQMD CEQA thresholds do not include specific screening criteria for bridge replacement and roadway improvement projects. However, when one compares the screening criteria established for the types of projects described above, it is reasonable to assume that the areal extent of construction activities associated with the bridge replacement project would be substantially less and would also not warrant a detailed air quality assessment. The Project, for example, would be conducted during one construction season (i.e., approximately eight months) and the total construction disturbance area is estimated to be 0.9 acre (i.e., 39,204 square feet) – well below the screening criteria. Therefore, given the temporary nature of the Project's construction phase and the scale of the Project it is not anticipated that construction activities would result in a cumulatively considerable net increase of PM_{10}. The short-term impact would be less than significant. Additionally, dust control measures required by Mitigation Measure AQ-1 would further minimize fugitive dust and emissions during construction.

Following construction, the Project would not result in a new stationary source of emissions and the roadway widening would not increase the vehicle capacity of Hill Road (i.e., no additional travel lanes along either side of the new bridge are proposed). Therefore, the Project would not result in any new mobile pollutant emissions and would not result in a cumulatively considerable increase in PM_{10} emissions. No long-term impact would occur.

III. c) Expose Sensitive Receptors to Substantial Pollutant Concentrations – Less than Significant Impact

Asbestos is a common name for a group of naturally occurring fibrous silicate minerals that are made up of thin, but strong, durable fibers. Asbestos is a known carcinogen and presents a public health hazard if it is present in the friable (easily crumbled) form. Naturally occurring asbestos would most likely be encountered in Franciscan ultramafic rock (primarily serpentinite) or Franciscan mélange.

The potential to encounter naturally occurring asbestos during construction was analyzed by reviewing published geologic maps and reviewing soil and rock types encountered in soil borings advanced at the Project site.

According to mapping published by the California Geological Survey, the geologic units underlying the Project site include variably deformed and metamorphosed sandstone (graywacke), mudstone, and chert associated with the Jura-Cretaceous rocks of the Franciscan Complex (Blackburn Consulting 2012). Pliocene-Pleistocene nonmarine sedimentary deposits of sandstone with lesser conglomerate, claystone,

and shale are locally shown on the west side of the channel. Surface materials within the stream channel are mapped as unconsolidated alluvium that consists of sand, gravel, and lesser silt/clay (Blackburn Consulting 2012). Mapping does not show the site within an ultramafic rock area, although northwest trending zones of such rock are mapped about 2 miles west of the site (Blackburn Consulting 2012).

A Preliminary Foundation Report prepared for the Project included advancement of four exploratory soil borings in the Project area. The soil and rock types encountered in the test borings were consistent with the published mapping described above. Ultramafic rocks, including serpentinite, were not encountered in the test borings. Therefore, no human exposure to naturally occurring asbestos is anticipated to occur. Following construction, Project operation would not expose sensitive receptors to substantial pollutant concentrations as the Project does not include any stationary source emissions or an increase in any mobile emissions. No long-term impact would occur.

III. d) Create Objectionable Odors – No Impact

Construction activities could result in short-term odors, such as diesel exhaust from construction equipment. Such odors would be temporary, occurring only during the construction period, and would disperse rapidly. Therefore, construction would not create objectionable odors affecting a substantial number of people. Following construction, there would be no features included in the Project that would, by their nature or design, result in a new source of odors. No impact would occur.

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
IV. Biological Resources				
Would the Project:				
a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?		✓		
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?		✓		
c. Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?				✓
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?			✓	
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?		✓		
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?				✓

Discussion:

Information presented in this biological resources analysis was taken from the Project's Natural Environment Study (NES) (GHD 2020) provided as Appendix A, unless noted otherwise.

The Project site is located in rural Mendocino County. The Hill Road Bridge crosses over Mill Creek. Mill Creek is a tributary to the Middle Fork Eel River, which then connects to the Eel River and flows into the Pacific Ocean just south of Humboldt Bay in northern California. Mill Creek in the biological study area (BSA) is typically dry during the summer months. Within the U.S. Geological Survey (USGS) National Hydrology Dataset, Mill Creek is classified as an intermittent stream.

The area immediately surrounding the Project includes rural residential properties. As noted above, Mill Creek typically has little to no flow during the summer months. The Project site is located within the Jamison Ridge 7.5-minute USGS quadrangle, Township 22N, Range 12W, Section 22.

A desktop literature and database review was conducted, followed by a reconnaissance-level survey conducted on August 30, 2012, of the BSA. In 2017 and 2019, the literature search and desktop review were updated by GHD biologists to reflect the most recent changes to special-status species and habitats. A reconnaissance level site visit was conducted in May 2019 by a GHD biologist to update habitat information and assess conditions for special-status species.

The BSA used for the survey includes the Project site and approximately 1,200 feet north and south from the Hill Road Bridge along Mill Creek. The literature search and desktop review update included: a review of the California Natural Diversity Database (CNDDB) records of special status species within 8.05 km (5 mi) of the project location; USFWS's Information for Planning and Consultation (IPaC) records of designated critical habitat and official species list; the California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants for a list of species documented in the nine-quadrangle area United States Geological Survey (USGS) quadrangles surrounding and including the project: Jamison Ridge, Covelo West, Covelo East, Newhouse Ridge, Dos Rios, Thatcher Ridge, Willis Ridge, Brushy Mountain, and Sanhedrin Mountain; the National Wetland Inventory maps; the Natural Resources Conservation Service (NRCS) Web Soil Survey ; and current aerial imagery (GHD 2020).

Special-status Species

Nine special-status plants and nine special-status animals were found to have potential to be present in the Project area and are described below.

Plants

Rattan's milk-vetch (*Astragalus rattanii var. rattanii*)

Rattan's milk-vetch is an annual herb that grows in riverbanks and sandbars of the North Coast Ranges. It is ranked as a CNPS 4.3 plant, indicating limited distribution in California, but not very endangered in California. This species has 2-10, pink-purple flowers with paler tips from April to July. Rattan's milk-vetch was not detected during the site survey (conducted after the blooming window for this species), but the BSA contains gravelly stream banks and collections of this species have been made in the vicinity. Nearest record is 3.37 km (2.1 mi) from Project area in 1980. The potential for occurrence in the Project area is medium.

Milo Baker's Lupine *(Lupinus milo-bakeri)*

Milo Baker's lupine is an herbaceous annual plant endemic to California and found in disturbed areas in foothill woodlands and valley grasslands. The species is designated a State-threatened species and California Rare Plant Rank 1B.1: Plants Rare, Threatened, or Endangered in California and Elsewhere and Seriously Threatened in California. The CNPS describes this species as known from fewer than 20 occurrences. Milo Baker's lupine is approximately 3 to 5 feet in height and its flowers go from blue to pale yellow through its flowering season from June through August. The BSA does not include substantial open disturbed areas. The disturbed margins adjacent to the roadway on either side of the Hill Road Bridge have low potential to support this species. Milo Baker's lupine was not detected during the site survey. Seven CNDDB occurrence records for Milo Baker's lupine were recorded within 5 miles of the Project location in and around the nearby town of Covelo, the most recent in 1986. This species is very rare and is not likely to be found in the BSA, therefore, potential for occurrence in the Project area is medium.

White–flowered rein orchid (*Piperia candida*)

The white-flowered rein orchid (*Piperia candida*) has a CNPS 1B.2 rare plant rank, indicating it is rare, threatened, or endangered in California and elsewhere and fairly endangered in California. It is a perennial plant found in both broadleaved and coniferous forests in the region. It is difficult to determine its range as populations often have small numbers and rarely flower. The BSA contains forest duff, mossy banks, and rock outcrops that have the potential to support white-flowered rein orchid; however, the BSA does not include serpentine soils and this species was not recorded during the site survey. The nearest occurrence record for this orchid is in the East Covelo Quadrangle, but specific information has been redacted due to its sensitivity. Potential for occurrence in the Project area is medium.

Cylinidrical trichodon (*Trichodon cylindricus*)

The cylindrical trichodon (*Trichodon cylindricus*) has a CNPS 2B.2 rare plant rank, indicating it is rare or endangered in California, but common elsewhere, and fairly endangered in California. This species is a moss that is not endemic to the state. Typical habitat for cylindrical trichodon includes sandy, exposed soil, and roadbanks within broadleafed upland forest, meadows and seeps, and upper coniferous forest. This species is not known to occur within five miles of the BSA and was not observed during the site survey; however, there are occurrence records within Mendocino County. The BSA includes roadsides within woodland habitat that could support cylindrical trichodon; however, the BSA does not include upper montane coniferous forest, meadows, or seeps. The nearest CNDDB/BIOS occurrence record is located more than five miles from the BSA. Potential for occurrence in the Project area is medium.

Nuttall's ribbon-leaved pondweed (*Potamogeton epihydrus ssp. nuttallii)*

Nuttall's ribbon-leaved pondweed is an aquatic perennial herb that is native to California. This species is designated a California rare plant rank 2.2: Plants fairly Rare, Threatened, or Endangered in California, but More Common Elsewhere. It is found in freshwater wetlands and wetland-riparian environments. It is rhizomatous, with horizontal subterranean plant stems with elongated dark green leaves. Suitable habitat within the BSA includes the standing water in the pools found along Mill Creek when the water flow is low or not flowing. Nuttall's ribbon-leaved pondweed was not detected during the site survey. The nearest CNDDB record for Nuttall’s ribbon-leaved pondweed is 17.7 miles from the Project area reported in the 1980’s. Potential for occurrence in the Project area is medium.

Konocti manzanita *(Arctostaphylos manzanita ssp. elegans)*

Konocti manzanita has a CNPS 1B.3 rare plant rank, indicating it is rare or endangered in California and elsewhere, but not very endangered in California. It is a California endemic perennial evergreen shrub found in volcanic areas within chaparral, cismontane woodland habitats, and lower montane coniferous forest habitats. Habitat for this species is present within the BSA and the species may be present. There are documented CNDDB occurrences with 3.5 mi of the project site. Potential for occurrence at the Project site is medium.

Three-fingered morning-glory (Calystegia collina ssp. tridactylosa)

Three-fingered morning-glory has a CNPS 1B.2 rare plant rank, indicating it is rare, threatened, or endangered in California and elsewhere and fairly endangered in California. It is a California endemic perennial rhizomatous herb found in serpentinite, rocky, gravelly, openings within

chaparral and cismontane woodland habitats. Habitat for this species is present within the BSA and the species may be present. However, there are no documented CNDDB occurrences with 4 mi of the Project site. Potential for occurrence at the Project site is medium.

Thin-lobed horkelia (*Horkelia tenuiloba*)

Thin-lobed horkelia has a CNPS 1B.2 rare plant rank, indicating it is rare, threatened, or endangered in California and elsewhere, and fairly endangered in California. It is a California endemic perennial herb found in mesic openings, sandy areas within Broad-leafed upland forest, valley and foothill grassland, and chaparral habitats. Habitat for this species is present within the BSA and the species may be present. There are no documented CNDDB occurrences with 5 mi of the Project site. Potential for occurrence at the Project site is medium.

Marsh checkerbloom (*Sidalcea oregana ssp. hydrophila)*

Marsh checkerbloom has a CNPS 1B.2 rare plant rank, indicating it is rare, threatened, or endangered in California and elsewhere and fairly endangered in California. It is a perennial herb found in mesic areas within meadows, seeps, and riparian forest habitats. Habitat for this species is present within the BSA and the species may be present. However, there are no documented CNDDB occurrences with 5 mi of the project site. Potential for occurrence at the Project site is medium.

Fish

California Coastal Chinook Salmon *(Oncorhynchus tshawytscha)*

The California coastal Chinook salmon is designated as a federally-threatened species. Mill Creek is designated as Critical Habitat for this species. Chinook salmon, also referred to as king salmon, are the largest of all the Pacific salmon species reaching typical lengths of 2.6 feet. They are anadromous, meaning they are born and reared in freshwater, migrate to the ocean to feed, and return to their natal streams to spawn and die. Spawning Chinook salmon typically choose stream beds with large gravel substrate that may be near deep pools, where they build a series of nests of reeds. When young Chinook salmon emerge as fry they are typically swept down to areas of slower water velocities. Chinook salmon then emigrate to the ocean where they remain for two to five years.

Chinook salmon were historically the most abundant salmonid throughout the Eel River system. In more recent times populations have crashed, and Chinook salmon continue to exhibit depressed population sizes relative to historical abundances throughout their range. Estimates of historical runs are based on the records of fish canneries on the Eel River operating from 1857 to 1921. By translating the output of canned fish to estimated run, it is thought that historical peak runs of chinook salmon numbered from 700,000 to 800,000, with average runs of 100,000 to 200,000 fish. Estimates from the 1960s are 55,000. Current runs are difficult to estimate due to insufficient data, but most recent numbers suggest that less than 1,000 wild adults are returning to the Eel River basin. Members of the Covelo Native American Community reported that Chinook salmon have not been observed in the Middle Fork Eel River, Williams Creek and/or Round Valley streams since about 1988.

No Chinook salmon were detected during the 2012 or 2019 site surveys. The 2012 field survey was conducted on August 30, 2012 during a time where there was no flow in Mill Creek within the BSA. The field survey yielded the observation of Sacramento pikeminnow *(Ptychocheilus grandis)* in

ponded water in the stream bed approximately 32.8 feet north of the bridge. The Sacramento pikeminnow is native to the California Central Valley and was introduced into the Eel River around 1980. They are a large piscivorous minnow, whose populations have thrived and are known to consume juvenile salmonids throughout the Eel River Basin. The May 2019 site visit found continuous, mostly shallow, water in Mill Creek that exceeded 50-feet wide in some places. Flow was barely visible. One Western Pond Turtle (*Emys marmorata*) was observed adjacent to the bridge and two adult bullfrogs and tadpoles were observed in a deep pool just upstream of the bridge. Several schools of small fish were observed in open water in the center of the channel and numerous small black tadpoles were present in a deep pool. The nearest CNDDB record for Chinook salmon is 107.2 kilometers (66.6 miles) from the Project area, recorded in 2000.

The research shows that this species is not likely to be found in Mill Creek. However, if they do spawn in either Mill Creek or Middle Fork Eel River, it is possible that the species may use Mill Creek for rearing and the possibility remains that juveniles may be present in ponded water at the site. Potential for occurrence in the Project area is low.

Steelhead *(Oncornynchus mykiss irideus)* Northern California ESU

Steelhead northern California ESU is designated as a federally-threatened species. Mill Creek is designated Critical Habitat for this species. This species has both an anadromous form, known as “steelhead” and a resident form known as “coastal rainbow trout”. Both forms are found within the Eel River system, with the rainbow trout occurring upstream of Scott Dam (approximately 25 miles southeast of the Project site) which is part of the Potter Valley Project. Adults typically reach lengths of 1.2 to 2.1 feet. Steelhead return to their natal streams to spawn, with similar spawning requirements to those of the Chinook. The young often spend two years in freshwater before outmigrating to the ocean. Steelhead may stay in saltwater for one to two years before returning to their native streams. Most anadromous salmonids die after spawning, but steelhead may make numerous trips back and forth between fresh and salt water to breed. Steelhead may spawn up to four times per life span, though many do not survive between breeding cycles.

No steelhead were detected during the 2012 or 2019 site surveys. The first field survey was conducted on August 30, 2012, during a time when there was no flow in Mill Creek within the BSA. The field survey yielded the observation of Sacramento pikeminnow in ponded water in the stream bed approximately 32.8 feet north of the bridge. As noted above, they are a large piscivorous minnow, whose populations have thrived and are known to consume juvenile salmonids throughout the Eel River Basin. The May 2019 site visit found continuous mostly shallow water in Mill Creek and exceeded 50-feet in some places. Flow was barely visible. One Western Pond Turtle was observed adjacent to the bridge and two adult bullfrogs and tadpoles were observed in a deep pool just upstream of the bridge. Several schools of small fish were observed in open water in the center of the channel and numerous small black tadpoles were present in a deep pool. The nearest CNDDB record for steelhead is 35 miles from the Project area, recorded in 1999. Potential for occurrence in the Project area is high.

Amphibians

Foothill Yellow-Legged Frog *(Rana boyllii)*

The foothill yellow-legged frog is designated a California species of special concern. This species is a moderately-sized amphibian, where adults are 1.5 to 3.5 inches long from snout to vent. Breeding typically occurs during a two-week period between late March and early June. Females

deposit eggs in clusters attached to gravel or rocks in moving water near stream margins, which hatch in about five days. Tadpoles reach maximum sizes of 2.2 inches and require water for at least three or four months for development. This species is rarely encountered far from permanent water. The nearest CNDDB record is 4.8 km (3 mi) from the Project area in 1913. The most recent record in the Project vicinity is 7.8 km (4.85 mi) from Project area in 1991. Due to habitat quality, and the observation of other frog species, and the close proximity of CNDDB records, it will be assumed that this species may be present during construction. Potential for occurrence in the Project area is high.

Western Pond Turtle (*Emys marmorata*)

Pond turtles occur in a variety of permanent and semi-permanent freshwater aquatic habitats including lakes, rivers, ponds, creeks, and marshes. Breeding can occur on loose soils on south or west facing slopes. The species is frequently observed basking on exposed banks, logs, and rocks. Winter activity is possible but limited to unusually warm, sunny days; normally pond turtles are dormant during winter months on the north coast; dormancy typically involved burrowing into loose substrate above the high water mark. Pond turtles have been documented nesting up to 0.5 kilometers from water. During the May 2019 site visit, one Western Pond Turtle was observed basking on large woody debris adjacent to the bridge. The Project area contains suitable habitat for Western Pond Turtles. Due to habitat quality and observations of a Western Pond Turtle within the Project area, it will be assumed that this species may be present during construction. Potential for occurrence in the Project area is high.

Mammals

Pallid Bat *(Antrozous pallidus)*

The pallid bat is designated as a State species of special concern. Pallid bats roost alone, in small groups (two to 20 bats), or gregariously. Day and night roosts include crevices in rocky outcrops and cliffs, caves, trees cavities and hollows, and various human structures such as bridges and barns. Roosts generally have unobstructed entrances/exits and are high above the ground, warm, and inaccessible to terrestrial predators. Mating occurs from October to February, birth of offspring from late April to July, and weaning in August. Maternity colonies disperse between August and October. Pallid bats' tendency to roost gregariously and their relative sensitivity to disturbance makes them vulnerable to mass displacement. Roosts can be lost due to timber harvest, recreational activities and demolition or disturbances to occupied man-made structures . Maternity colonies are especially susceptible to disturbance. Loss or modification of foraging habitat is also a threat.

No pallid bats were detected during the site survey. The nearest CNDDB occurrence record for the pallid bat was recorded 4 miles from the Project area. The existing Hill Road Bridge has a wood deck with small spaces between the decking boards, with some gaps where the joists meet the buttresses. A detailed visual survey of the bridge structure was performed. No individuals or evidence of bats, such as rub marks or guano, were observed. However, the numerous gaps in the wooden bridge within a riparian habitat are suitable roosting habitat for this species. There is also excellent foraging habitat in the riparian corridor along Mill Creek. Therefore the presence of pallid bats is possible and the potential for occurrence in the Project area is high.

Western Red Bat *(Lasiurus blossevillii)*

The western red bat is designated as a State species of special concern. They are typically solitary animals preferring riparian areas dominated by walnuts, oaks, willows, cottonwoods, and sycamores. They roost primarily in the foliage of trees or shrubs. Western red bats mate in late summer or early fall and give birth in summer. Although typically solitary, they appear to migrate in groups and forage in close association with one another in summer. This species is considered to be highly migratory. The timing of migration and the extent of summer ranges is poorly understood.

No western red bats were detected during the site survey. In California, about 83 percent of the breeding records for western red bat are from the Central Valley with other breeding records in southern California. These bats disperse throughout low elevation areas of California. The riparian habitat within the BSA provides suitable roosting and foraging habitat for the Western red bat. The nearest CNDDB record is 4 miles from the Project area, date unknown. Therefore, the potential for presence of western red bats is high, but it is unlikely that maternity roosts will be present in the BSA.

Hoary bat (*Lasiurus cinereus*)

The hoary bat (*Lasiurus cinereus*) is designated as a state species of special concern. These bats are solitary and typically roost three to five meters off the ground in the foliage of trees as opposed to caves. They hunt insects in open areas or along streams and lakes. Though common across the United States, a fungal disease called “whitenose syndrome” has reduced huge numbers of North American bat populations. This species in particular has not yet been largely affected, but CNDDB tracks reports of the species. The riparian corridor and woodlands within the BSA provide suitable roosting and foraging habitat for the hoary bat. The nearest CNDDB/BIOS occurrence record is 6.4 km (4 mi) from the BSA and dated 1998. Therefore, the potential presence for this species is high.

Long-eared myotis (*Myotis evotis*)

The long-eared myotis (*Myotis evotis*) is designated as a Bureau of Land Management sensitive species, International Union for Conservation of Nature species of least concern and a Western Bat Working Group species of medium priority. These bats are either solitary or roosts in colonies of up to 30 individuals. These bats utilize a wide range of roost including trees, snags, stumps, abandoned buildings, and caves. They hunt insects both from the air as well as substrate-gleaning. Though common across the Pacific states, a fungal disease called “white-nose syndrome” has reduced huge numbers of North American bat populations. This species in particular has not yet been largely affected, but CNDDB tracks reports of the species. The BSA does not contain coniferous forests; but, the riparian corridor, woodlands, and existing bridge could provide suitable roosting and foraging habitat for the long-eared myotis. The nearest CNDDB/BIOS occurrence record is 6.4 km (4 mi) from the BSA and dated 1998. Therefore, the potential presence for this species is medium.

North American porcupine (*Erethizon dorsatum*)

The North American porcupine (*Erethizon dorsatum*) is not currently listed under the FESA or CESA, but is considered a special animal by CDFW that is being tracked in the CNDDB. Porcupine are nocturnal, cryptic animals, leading solitary lives except when mating in the autumn. They climb into trees during summer days and stay near a den during winter months. Gestation takes 202 days to complete, one of the longest among rodents, and only one young is born at a time. Once

considered a nuisance species, in recent years few sightings have been made and there is concern that populations in the west are in alarming decline. Loss of habitat, forest succession, poisoning and low reproductive ability could be contributing to reduced numbers. The BSA contains woodland habitat suitable for presence of North American porcupine, but the existing road(s) may fragment the habitat for this species. The nearest CNDDB/BIOS occurrence record is 7.9 km (4.9 mi) from the BSA and dated 1961. Therefore, the potential presence for this species is medium.

Obscure Bumble Bee (*Bombus caliginosus*)

The Obscure Bumble Bee, is a California Special Status Species. It is primarily black with yellow on the head, forward half of the thorax, and on the fourth tergite. Individuals can live approximately one year. They occur in coastal habitat within the fog-belt from British Columbia to southern California. Their populations have experienced severe declines rangewide. These declines are poorly understood, largely because they overlap with *Bombus vosnesenskii*, a common bee that is difficult to distinguish from *B. caliginosus* in the field. The BSA falls within the current documented range of the Obscure Bumble Bee and includes fog-belt coastal habitat preferred by the species. Preferred plants for foraging (such as *Grindelia* sp, *Baccharis* sp., and *Lupinus* sp.) may be present adjacent to the Project area. California Department of Fish and Wildlife records have documented the species from the project vicinity. Based on the location of the BSA, the possible presence of host plants in the area, and documented presence of the species in the project vicinity, the Obscure Bumble Bees has a moderate likelihood of occurring within the study area.

Sensitive Communities

Vegetation communities occurring in the BSA that are typical of the region include woodland alliance - blue oak woodland (*Quercus douglassii*), woodland alliance - Valley oak woodland (*Quercus lobata*), shrubland alliance- Arroyo Willow thickets (Salix lasiolepis), and aquatic features. No special-status biological communities, as tracked by CNDDB, are known to exist within the BSA.

Woodland Alliance - Blue Oak Woodland *(Quercus douglassii)*

Blue oak woodland is present along the perimeter of the project limits and the border of the BSA situated furthest from Mill Creek. Dominated or co-dominated by blue oaks, the canopy ranges from intermittent to continuous with a sparse to intermittent shrub layer.

Woodland Alliance – Valley Oak Woodland (*Quercus lobata*)

Within the Project limits, the valley oak woodland is found in the upland area surrounding the existing Hill Road Bridge to the north and south along Mill Creek. Other species identified during the site survey within this alliance include blue oak (*Quercus douglassii*), black oak (*Quercus kelloggii*), foothill pine (*Pinus sabiniana*), poison oak (*Toxicodendron diversilobum*), and Himalayan blackberry (*Rubus armeniacus*).

Shrubland Alliance- Arroyo Willow Thickets *(Salix lasiolepis)* Arroyo willow thickets occur throughout the state along intermittent and permanent stream edges and drainages in the Northern CA Coast Ranges. This habitat is adapted to withstand, but is often modified by, winter flooding. These willows can reach to more than 30 ft. tall and form an open to continuous canopy over a variable herbaceous layer. CWHR classifies it under its Fresh emergent wetland habitat. This is considered among some of the most productive habitats for wildlife in California. Arroyo willow thickets form a patchy riparian corridor along Mill Creek within the BSA.

Aquatic Features

Mill Creek is an aquatic feature. A survey of Mill Creek was performed at the Project location to delineate the ordinary high water mark (OHWM) and lateral extent of the ephemeral/intermittent channel in accordance with U.S. Army Corps of Engineers guidelines. The results are provided in the Project's waters delineation report (GANDA 2013a), and provided as an attachment to Appendix A. Mill Creek in the BSA had no flow during the biological resource site visit on August 30, 2012. Ponded water was present in the creek channel on either side of the underside of the bridge. During the May 2019 site visit continuous low flow was observed. On-site observations of snags and debris in adjacent vegetation near a measuring panel attached to the existing Hill Road Bridge abutments indicate high water flow was approximately 13 feet above the creek bed. The creek bed had low vegetation cover (<10 percent). Survey of the creek bed found early successional herbs. These include mule fat (*Baccharis salicifolia*), prostate pigweed (*Amaranthus blitoides*), turkey mullein (*Eremocarpus setigerus*), smoothstem shining star (*Mentzelia laevicaulis*), black willow (*Salix nigra*), vinegar weed, (*Trichostema lanceolatum*), and cocklebur (*Xanthium strumarium*).

IV. a) Impacts to Special-status Species – Less than Significant with Mitigation

Special-status species are plant and wildlife species that are legally protected under the Federal Endangered Species Act (FESA), California Endangered Species Act (CESA) or other State regulations, and/or species that are considered sufficiently rare by the scientific community to warrant conservation concern. There are nine special-status plants and nine special-status animals that have a moderate to high potential to be present in the Project area. Project impacts to special-status species are presented below.

Special-status Plant Species

Special-status plants that could potentially be present in the Project area include Rattan's milk-vetch, Milo Baker's lupine, white-flowered rein orchid, Cylindrical trichodon, Nuttall's ribbon-leaved pondweed, Konocti manzanita, Three-fingered morning-glory, Thin-lobed horkelia (Horkelia tenuiloba), and Marsh checkerbloom. The potential occurrence of these species in the Project area is medium to high. If they are present in the Project area, construction of the Project could result in significant impacts to these species. Mitigation Measure BIO-1 includes preconstruction surveys, agency coordination, and other measures to protect special-status plants with the potential to occur in the Project area.

Mitigation Measure BIO-1: Avoid Impacts to Special-status Plants

Prior to any ground disturbance, MDOT shall have a qualified botanist or biologist conduct a special-status plant survey in the BSA during a time of year when the special-status species with the potential to occur in the BSA, as described in the NES (GHD 2020), are blooming and identifiable. A report summarizing the results of the plant survey shall be provided to MDOT. If a special-status plant is found, the report shall also recommend location-specific avoidance measures to implement during construction, including appropriate set-backs and installation of protective temporary construction fencing. If avoidance is not feasible, a Special-Status Plant Management Plan shall be prepared in coordination with California Department of Fish & Wildlife, in which recommendations shall be provided as to the feasibility of relocating the plants or collecting seeds prior to the start of construction. Suitable habitat for plant relocation may exist within the BSA that could accommodate relocation, seed spreading, or planting. If seed collection is determined to be the more appropriate method for the specified species, seeds shall either be collected and spread on- or off-site, or provided to a local native plant nursery for propagation then planting. Success will be determined by

no net loss of individual plants, or acreage, as appropriate for the respective species, after two years of monitoring. For both relocating or seed collection, the Plan shall indicate an on- or off-site location for relocation, identify species-specific success criteria, and identify monitoring protocol of the site for 1 to 2 seasons.

With implementation of mitigation measure BIO-1, potential impacts to Rattan's milk-vetch, Milo Baker's lupine, white-flowered rein orchid, Cylindrical trichodon, Konocti manzanita, Three-fingered morning-glory, Marsh checkerbloom, and Nuttall's ribbon-leaved pondweed would be reduced to less-than-significant levels.

Special-status Wildlife Species

Fish

Special-status fish species with the potential to be present in the Project area include Chinook salmon, and steelhead.

The Project is designed to avoid impacts to special-status fish species; no permanent structures would be placed in the stream channel and in-channel construction activities would be limited to summer months when Mill Creek has little to no flow. Placement of rock slope protection (RSP) and contouring of the stream channel would not create permanent impacts to these species because the placement of RSP would not impede or diminish stream flow. Pile driving associated with the Project is also not anticipated to impact fish species at the site. Hydroacoustic impacts to aquatic species occur when underwater noise generated by pile driving is transmitted to the species, which can cause damage to tissues and organs. However, because bridge piles would be located outside of the creek channel, and because the creek channel would be mostly dry at the time of the activity, the energy created from pile driving for the bridge abutments is anticipated to dissipate as it travels through the soils to levels low enough to not cause damage to aquatic species prior to encountering any ponded water.

No special-status fish species were found at the Project site during either site surveys, and they are not expected to be present in the Project area during the construction phase. However, there is a low potential for these fish species to be present in ponded water in Mill Creek during summer months. Any impacts to these species due to Project construction activities would be significant. Implementation of Mitigation Measure BIO-2 requires preconstruction surveys and stream protection measures to avoid potential impacts to special-status fish species. Implementation of Mitigation Measure HYD-1 would minimize impacts to Miller Creek and thereby reduce impacts to special-status fish species.

Mitigation Measure BIO-2: Avoid Impacts to Special-status Fish Species

Prior to the start of ground disturbance, and if water is present within the Area of Potential Effect, surveys for listed fish species shall be conducted by a qualified biologist in pooled or moving water within 200 feet of the bridge seven days prior to the beginning of construction (including any creek diversion or dewatering activities). If discovered, additional fish protection activities would be coordinated with NMFS and may include translocation of Steelhead under incidental take authority. A suitable release location would be identified in advance within Mill Creek, and a translocation plan prepared for agency pre-approval. Translocation would be carried out by a qualified biologist pre-approved by NMFS. Additional efforts may include high visibility fencing to keep construction activities

separate from ponded water, and daily construction monitoring. Downed trees, stumps, and other refugias within aquatic areas would remain undisturbed as much as possible.

Prior to the start of ground disturbance, including placement of diversion structures, a qualified biologist shall provide on-site worker environmental awareness training (tailboard) for crews at the commencement of construction. The training will include identification and life history of sensitive species (including the special status salmonids), applicable regulations, species and habitat protection measures, fines and penalties, and procedures to be followed if sensitive species are observed on-site.

Given the potential for water and salmonids in the channel during construction activities, a Stream Diversion and Fish Relocation Plan will be prepared by Mendocino County Department of Transportation prior to construction in coordination with NMFS. The plan will be submitted to MDPT and NMFS for approval prior to implementation. Final plan components will include, at minimum, a fish relocation protocol (i.e., individuals will be kept in insulated coolers equipped with battery operated aerators to ensure survival) and a process for identifying release sites elsewhere in the channel with conditions suitable to ensure survival during the work window. All relocation work would be conducted by a qualified biologist pre-approved by NMFS.

Mitigation Measure HYD-1: Minimize Impacts to Mill Creek during Construction

See discussion in X.a,f for a description of this mitigation measure.

With implementation of Mitigation Measure BIO-2 and HYD-1, potential impacts to Chinook salmon and steelhead would be reduced to less-than-significant levels.

Amphibians

The foothill yellow-legged frog was not detected during the site survey performed for this Project. However, there is high potential for the species to be present in the Project area because it contains excellent habitat, including a rocky stream, with areas of sunny banks and ponded water. Impacts to the foothill yellow-legged frog due to Project construction would be significant. With implementation of Mitigation Measure BIO-3, which requires preconstruction surveys and worker awareness training, potential impacts to foothill yellow-legged frogs would be reduced to less-than-significant levels.

Mitigation Measure BIO-3: Avoid Impacts to Foothill Yellow-legged Frogs

The following measures shall be implemented during construction:

- A qualified biologist shall provide a worker environmental awareness training (tailboard) for crews prior to the start of ground disturbance. The training will include identification and life history of sensitive species (including Foothill Yellow-legged Frog), applicable regulations, species and habitat protection measures, fines and penalties, and procedures to be followed if sensitive species are observed on-site (e.g., such as stop work and appropriate agency representatives to contact for additional guidance).
- A qualified biologist shall conduct a preconstruction survey along Mill Creek within and adjacent to the Project area no more than one week before the start of construction and move any frogs within the construction area downstream and outside of the construction area. In addition, a qualified biologist will provide on-site monitoring for the duration of the installation of the

dewatering method and any de-watering activities, if necessary. Any FYLF within the work area shall be relocated to the nearest suitable habitat (preferably within the same waterbody). Potential relocation sites shall be identified by the biologist prior to the start of construction.

- Bare hands shall be used to capture frogs. Biologists will not use soaps, oils, creams, lotions, repellents, or solvents of any sort on their hands within two hours before and during periods when they are capturing and relocating individuals.
- Exclusion fencing may also be installed, as recommended by regulatory agencies, to prevent foothill yellow-legged frogs from entering the work area. If a pond containing tadpoles is located within 15.2 m (50 ft.) of construction activities, high visibility fencing will be installed around the edge of the pond (including immediately adjacent hydrophilic vegetation) to exclude construction activities and personnel for the duration of construction within Mill Creek to ensure protection.
- If frogs accumulate along exclusion fencing, a qualified biologist will relocate them as described above (i.e., bare hands, and moved to nearest, previously identified suitable habitat) to prevent stranding. Refugia, such as wet boards or cobble, may be placed along fencing to prevent mortality.

Birds

Although no listed or special-status avian species are likely to be present in the BSA during construction, habitat at the Project area and vicinity likely serves breeding and foraging for numerous common avian species. Common, native avian species and their nests are protected by the Federal Migratory Bird Treaty Act and California Fish and Game Council. Therefore, the area of construction-related disturbance would be limited to the extent practicable. However, some disturbance within oak woodland arroyo willow thickets would still occur. As nesting birds could still nest in the Project area, Project construction impacts (e.g., tree removal, tree trimming, or brush clearing) would be significant. With implementation of Mitigation Measure BIO-4, which requires preconstruction surveys for active bird nests and worker awareness training, potential impacts would be reduced to less-than-significant levels.

Mitigation Measure BIO-4: Avoid Impacts to Nesting Birds

The following measures shall be implemented to protect migratory nesting birds:

- Construction shall be restricted to daylight hours.
- Ground disturbance and vegetation clearing shall be conducted, if possible, during the fall and/or winter months and outside of the avian nesting season (March 15 – August 15) to avoid any direct effects to special status and protected birds. If ground disturbance cannot be confined to work outside of the nesting season, a qualified ornithologist shall conduct pre-construction surveys within the vicinity of the Project area, to check for nesting activity of native birds and to evaluate the site for presence of raptors and special-status bird species. The ornithologist shall conduct a minimum of one day pre-construction survey within the 7-day period prior to vegetation removal and ground-disturbing activities. If ground disturbance and vegetation removal work lapses for seven days or longer during the breeding season, a qualified biologist shall conduct a supplemental avian pre-construction survey before project work is reinitiated.
- If active nests are detected within the construction footprint or within 500-ft of construction activities, the biologist shall flag a buffer around each nest. Construction activities shall avoid nest sites until the biologist determines that the young have fledged or nesting activity has

ceased. If nests are documented outside of the construction (disturbance) footprint, but within 500-ft of the construction area, buffers will be implemented as needed. In general, the buffer size for common species would be determined on a case-by-case basis in consultation with the CDFW and, if applicable, with USFWS, but shall not be less than 250 feet. Buffer sizes will take into account factors such as (1) noise and human disturbance levels at the construction site at the time of the survey and the noise and disturbance expected during the construction activity; (2) distance and amount of vegetation or other screening between the construction site and the nest; and (3) sensitivity of individual nesting species and behaviors of the nesting birds.

- If active nests are detected during the survey, the qualified ornithologist shall monitor all nests at least once per week to determine whether birds are being disturbed. Activities that might, in the opinion of the qualified ornithologist, disturb nesting activities (e.g., excessive noise), shall be prohibited within the buffer zone until such a determination is made. If signs of disturbance or distress are observed, the qualified ornithologist shall immediately implement adaptive measures to reduce disturbance. These measures may include, but are not limited to, increasing buffer size, halting disruptive construction activities in the vicinity of the nest until fledging is confirmed, placement of visual screens or sound dampening structures between the nest and construction activity, reducing speed limits, replacing and updating noisy equipment, queuing trucks to distribute idling noise, locating vehicle access points and loading and shipping facilities away from noise-sensitive receptors, reducing the number of noisy construction activities occurring simultaneously, and/or reorienting and/or relocating construction equipment to minimize noise at noise-sensitive receptors.

Bats

Several bat species have the potential to be present in the Project area. The pallid bat, western red bat, and Hoary bat have high potential to occur in the Project area, because the riparian corridor in the Project area includes man-made structures, such as the existing bridge and residences that provide suitable roosting habitat. The activity most likely to have impacts on pallid bats is the dismantling of the existing Hill Road Bridge, where roosting bats may be present (although evidence of presence was not detected in the field). The activity most likely to have impacts on the western red bat and Hoary bat is tree trimming/removal. While roosting western red bats may be present in foliage, due to breeding patterns, no maternal roosts are expected.

The long-eared Myotis has a medium potential to occur in the Project area, as they prefer coniferous forests, which are absent, but, the riparian corridor, woodlands, and existing bridge could provide suitable roosting and foraging habitat for this species.

Pallid bat are also extremely sensitive to disturbance at their roosting sites, and because they roost in colonies, these species are susceptible to mass displacement. Therefore, potential impacts to pallid bat, western red bat, Hoary bat and bathe long-eared myotis due to Project construction activities would be significant. With implementation of Mitigation Measure BIO-5, which requires preconstruction surveys for bats and bat roosting, worker awareness training, as well as daily monitoring and installation of exclusion fencing, potential impacts to protected bat species would be reduced to less-than-significant levels.

Mitigation Measure BIO-5: Avoid Impacts to Roosting Bats

The following measures shall be implemented during construction:

- Construction noise may disturb bats in the project vicinity during the bat maternity season (May 1st through August 30th). A qualified bat biologist shall conduct a pre-construction visual survey within the 7-day period prior to the start of construction for special-status bats in the impact area, consisting of the Project area and immediate vicinity (within 300 feet) edge of construction. Survey methodology should include visual examination of suitable habitat areas (e.g., the bridge itself) for signs of bat use.
- If no bat utilization or roosts are found, then no further study or action is required. If bats are found to utilize the Project area, or presence is assumed, a bat specialist should be engaged to advise the best method to prevent impact. If the presence of a maternity roost is confirmed, roost removal will be prohibited during maternity season and no construction activity generating significant noise shall occur within 300 feet of the roost. If special status bat species are found to roost at the bridge or trees planned for removal and trimming, additional avoidance and minimization measures shall be developed. Additional efforts may include establishing work window outside the maternity roost season for tree removal, daily construction monitoring for existing bridge removal and tree trimming activities, efforts to exclude bats from the existing bridge structure prior to removal, and slow deliberate removal of the wood decking on the existing bridge with a qualified biological monitor on-site. The County shall consult with California Department of Fish and Wildlife to determine whether there is a need for any additional or equally effective alternative measures for protecting bats with young, if present.
- Additional avoidance measures may include bat exclusion structures to be installed on the bridge between March 1 and April 15, prior to pupping season. If an exclusion structure is to be used, the measure will include a pre-installation survey of areas occupied by bats to properly install one way exits. This installation will be overseen by a qualified bat biologist and monitored every two weeks leading up to construction. If exclusion fails, and an active nursery establishes, disturbance of the bats shall be avoided until the biologist determines that breeding is complete and young are reared.
- A qualified biologist shall provide an on-site worker environmental awareness training (tailboard) for crews at the commencement of construction. The training will include identification and life history of sensitive species (including special status bats), applicable regulations, species and habitat protection measures, fines and penalties, and procedures to be followed if sensitive species are observed on-site.

Essential Fish Habitat

Essential fish habitat (EFH) includes those waters and substrate necessary for fish spawning, breeding, feeding, or growth to maturity. Permanent changes to EFH in the Project area include the increase in shaded area and the re-contoured creek bank. (Installation of the new abutments supporting the new bridge would be installed behind the existing abutments and further up the channel bank, effectively widening the opening at the bridge by approximately 20 feet on the west bank and 10 feet on the east bank). The existing bridge creates approximately 2,160 square feet of shade, while the new bridge would create approximately 3,970 square feet. This would be an increase of 1,810 square feet of shading over Mill Creek. Once construction of the new bridge and RSP installation is complete, exposed and disturbed areas of the creek bank and construction area would be seeded and mulched. Native plants including locally sourced willow cuttings would be used for re-vegetation.

Temporary impacts to Mill Creek from the construction access road, the potential diversion of low creek flows, potential de-watering of standing water in the immediate vicinity of the construction activities, and removal of the existing concrete bridge abutments in the creek banks have the potential to significantly affect EFH. However, mitigation measure HYD-1 would reduce impacts to EFH to less-than-significant levels by minimizing impacts to Mill Creek during construction. With implementation of mitigation measure HYD-1, Mill Creek is expected to continue to provide EFH for salmonids.

Mitigation Measure HYD-1: Minimize Impacts to Mill Creek during Construction

See discussion in X.a,f for a description of this mitigation measure.

IV. b) Impacts to Riparian or Sensitive Natural Community – Less than Significant with Mitigation

There are three natural communities of special concern within the Project area: blue oak woodland, which is present along the perimeter of the Project limits and the border of the BSA situated furthest from Mill Creek, valley oak woodland, which is the dominant Oakland woodland throughout the BSA situated beyond the riparian corridor associated with the creek and along Hill Road, and arroyo willow thickets, which form a patchy riparian corridor along Mill Creek within the BSA. Project impacts to riparian habitat are estimated at 0.1 acre for valley oak woodland, and 0.05 acre for black willow forest (see Figure 5 in Appendix A).

The Project would result in both temporary and permanent impacts to riparian communities within the Project area. Temporary impacts would occur from tree trimming and understory vegetation clearing during construction. This would likely be limited to the immediate area around the existing concrete abutments and the narrow strip along Hill Road for roadway shoulder widening. As described in the Project description, once work is complete, disturbed construction areas would be re-vegetated with fast-growing native plants (including locally-sourced willow cuttings), along with commercial hydraulic mulching materials. In total, implementation of the Project may require the removal of seven oak trees (five with a tree trunk diameter greater than 12 inches and two with a diameter of 10 inches or smaller), one pine tree (14 inches in diameter), seven willow trees (four with a tree trunk diameter greater than 12 inches and three with a diameter of 10 inches or smaller), and six madrone trees (all smaller than 10 inches in diameter) may be removed. If the impacts to oak trees are limited to brushing, this may be considered a temporary impact. Tree removal has been minimized by locating the new bridge in the same location as the existing bridge. However, the loss of riparian habitat due to Project activities, including tree trimming and tree removal, would be significant.

Mitigation Measure BIO-6 would reduce impacts to riparian habitat in the Project area to less-than-significant levels by implementing tree protection measures and requiring habitat replacement for oak woodlands.

Mitigation Measure BIO-6: Tree Protection and Replacement Plan

In accordance with the Mendocino County General Plan Policies RM-1, RM-24 and RM-27, Mendocino County shall preserve and protect trees in and adjacent to the Project area to the extent feasible. Prior to construction, an arborist certified by the International Society of Arboriculture shall conduct site surveys of the construction area and provide recommendations to ensure protection of trees and tree roots during construction activities such as the removal of the existing bridge abutments, the placement of new bridge abutments, re-contouring of the Mill Creek stream banks, and roadway widening.

Tree protection measures could include minimizing grading as much as possible; protecting trees and roots with exclusion fencing; limiting access to areas with protected trees; limiting tree trimming to the minimum necessary for construction clearance and site and equipment access; and conforming to standard tree trimming practices designed to protect trees such as the International Society of Arboriculture Pruning Standards.

Per the Mendocino County General Plan Policy RM-28, if oak woodland habitat is lost due to tree removal, replacement of lost oak woodlands or preservation of oak woodlands shall be provided at a 2:1 ratio. The arborist shall assist Mendocino County in determining the acreage of oak woodland lost, determining if on-site restoration is feasible, and locating an off-site location for mitigation if required.

If replacement trees are required, the County shall implement a five-year maintenance and monitoring program in which the County shall inspect the mitigation planting area for the purpose of adapting maintenance techniques if necessary. Survival surveys shall be conducted biannually for five years. The County shall use the following sliding scale performance standard for evaluation of the restoration's success:

- First year – 95%
- Second year – 90%
- Third year – 85%
- Fourth year – 80%
- Fifth year – 75%

Trees shall be considered alive and healthy if they display noticeable growth and the presence of new shoots.

The Project has also been designed to avoid or minimize impacts to Mill Creek. Construction of a single-span weathering steel truss bridge with no in-channel piers has reduced the need for work within the stream channel and avoids permanent fill within the stream channel. Additionally, restricting work in the Mill Creek channel to the summer months when the channel has little or no flow further reduces temporary impacts to Mill Creek. Once construction of the new bridge and RSP is complete, exposed and disturbed areas of the creek bank would be re-vegetated similar to other construction areas as previously described, with fast-growing native plants, including locally-sourced willows. RSP placement would be located outside of the creek channel and would also protect against potential erosion. Additionally, all work areas would be returned to pre-existing contours and natural conditions upon completion of work.

Approximately 0.14 acre of jurisdictional waters at Mill Creek would experience temporary impacts due to access for this Project which would take place when the creek is dry. Temporary impacts include an access road for construction equipment into the creek channel, the potential diversion of low creek flows, potential de-watering of standing water in the immediate vicinity of the construction activities, and removal of the existing concrete bridge abutments in the creek banks. Mitigation measure BIO-7 and HYD-1 would reduce impacts to less-than-significant levels by avoiding and minimizing impacts to Mill Creek during construction and adequately compensating for fill.

Mitigation Measure BIO-7: Compensate for Impacts to Waters

MDOT shall avoid impacts to waters to the extent feasible. If fill cannot be avoided MDOT shall compensate for impacts to creeks and other waters, by creation, restoration, or preservation of waters so that there is no net loss (1:1 ratio or as required by resource agencies). Required permits from the U.S. Army Corps of Engineers, the Regional Water Quality Control Board, and the California Department of Fish and Wildlife shall be received prior to that start of any on-site construction activity. MDOT shall ensure any and all additional measures outlined in the permits are implemented.

Mitigation Measure HYD-1: Minimize Impacts to Mill Creek during Construction

See discussion in X.a,f for a description of this mitigation measure.

IV. c) Impacts to Wetlands – No Impact

A field assessment was conducted to delineate waters of the United States within the Project area. No wetlands were found at or adjacent to the Project site and no vegetation was observed growing from within the Mill Creek channel (GANDA 2013a).

IV. d) Movement of Fish or Wildlife Species – Less than Significant

Please refer to Impact IV.a above regarding the potential impacts to nesting birds and bats.

The Project is designed to avoid impacts to special-status aquatic species. The Project would not place any permanent bridge structures in the creek channel. Construction activities and disturbance within the creek channel would be limited to the summer months when Mill Creek has little to no flow within the BSA; therefore, the Project would not interfere with the movement of aquatic species through the Project area. If water is present in the Project area, flow would be diverted by a low-flow diversion technique allowing for flow to continue through the Project area during construction. Additionally, an impediment to the movement of foothill yellow-legged frog would be limited to Project construction, which would be temporary in duration and limited to the Project area and, therefore, not substantial. The creek corridor and associated riparian vegetation would only be minimally impacted with RSP placement and channel contouring, as well as vegetation removal. The Project would not prevent the movement of special-status birds or bats throughout the Project area, because it does not include any new permanent infrastructure or structures that would sever the Project area from surrounding habitats. Construction would occur only during daylight hours, allowing for normal nocturnal wildlife patterns. Therefore, impacts to fish or wildlife movement corridors would be less than significant.

IV. e) Conflict with Local Policies or Ordinances, including Tree Preservation – Less than Significant with Mitigation

The Mendocino County General Plan (2009) contains numerous policies and action items to protect biological resources. The policies include protecting oak woodlands, protecting special-status species, conserving and restoring natural resources, and restricting conversion and fragmentation of stream corridors, oak woodlands, and other natural environments, and ensuring construction adjacent to creek channels is sensitive to the natural environment. Specific policies relevant to the Project are listed below.

Policy RM-1: Protect stream corridors and associated riparian habitat.

Action Item RM-1.1: Require adequate buffers for all projects potentially impacting stream corridors and/or their associated riparian habitat.

Policy RM-24: Protect the County's natural landscapes by restricting conversion and fragmentation of timberlands, oak woodlands, stream corridors, farmlands, and other natural environments.

Policy RM-25: Prevent fragmentation and loss of our oak woodlands, forests, and wildlands and preserve the economic and ecological values and benefits.

Policy RM-27: Conserve, restore and enhance natural resources, sensitive environments, and ecological integrity.

Action Item RM-27.1: Identify and maintain wildlife movement corridors to support biodiversity and healthy natural processes.

Policy RM-28: All discretionary public and private projects that identify special-status species in a biological resources evaluation (where natural conditions of the site suggest the potential presence of special-status species) shall avoid impacts to special-status species and their habitat to the maximum extent feasible. Where impacts cannot be avoided, projects shall include the implementation of site-specific or project-specific effective mitigation strategies developed by a qualified professional in consultation with State or federal resource agencies with jurisdiction (if applicable) including, but not limited to, the following strategies:

- Preservation of habitat and connectivity of adequate size, quality, and configuration to support the special-status species. Connectivity shall be determined based on the specifics of the species' needs.
- Provision of supplemental planting and maintenance of grasses, shrubs, and trees of similar quality and quantity to provide adequate vegetation cover to enhance water quality, minimize sedimentation and soil transport, and provide adequate shelter and food for wildlife.
- Provide protection for habitat and the known locations of special-status species through adequate buffering or other means.
- Provide replacement habitat of like quantity and quality on- or off-site for special-status species.
- Enhance existing special-status species habitat values through restoration and replanting of native plant species.
- Provision of temporary or permanent buffers of adequate size (based on the specifics of the special-status species) to avoid nest abandonment by nesting migratory birds and raptors associated with construction and site development activities.
- Incorporation of the provisions or demonstration of compliance with applicable recovery plans for federally listed species.

Action Item RM-28.1: The County shall develop CEQA standards that require disclosure of impacts to all sensitive biotic communities during review of discretionary projects. These standards shall require the following mitigation:

- *Sensitive Biotic Communities – For all sensitive biotic communities, restore or create habitat at a no net loss standard of habitat value lost. Where it is determined that restoration or creation are ecologically infeasible, preserve at a 2:1 ratio for habitat loss.*
- *Oak Woodland – Maintain and improve oak woodland habitat to provide for slope stabilization, soil protection, species diversity and wildlife habitat through the following measures:*

- Preserve, to the maximum extent possible, oak trees and other vegetation that occur near the heads of drainages or depressions to maintain diversity of vegetation type and wildlife habitat as part of agricultural projects.
- Comply with the Oak Woodlands Preservation Act (PRC Section 21083.4) regarding oak woodland preservation to conserve the integrity and diversity of oak woodlands, and retain, to the maximum extent feasible, existing oak woodland and chaparral communities and other significant vegetation as part of residential, commercial, and industrial approvals.
- Provide appropriate replacement of lost oak woodlands or preservation at a 2:1 ratio for habitat loss.

The replacement bridge would be a span bridge in the same location as the existing bridge that avoids the placement of permanent fill in the creek channel. The new bridge abutments would be set further bank from the creek channel than the existing abutments, and the RSP included as part of the Project is the minimum necessary to provide erosion control and contouring after the existing abutments are removed. The footprint of disturbed riparian areas has also been minimized to the extent practicable, and disturbed areas would be revegetated after construction is completed. Therefore, the Project would conserve and restore natural resources and sensitive environment, and would not fragment or convert natural habitats including stream corridors and oak woodlands, as required by policies RM-24, RM-25, and RM-27.

As discussed in Impact IVa, the Project has the potential to significantly impact 13 special-status species. Additionally, the Project would remove up to 30 trees, some of which include oak woodlands. Mitigation Measures BIO-1 through BIO-7 and HYD-1 would serve to mitigate these impacts to less-than-significant levels by requiring surveys and monitoring for special-status species, requiring tree replacement in compliance with the County's oak protection policy, and minimizing impacts to Mill Creek during construction. Therefore, the Project, as mitigated, would also be consistent with policies RM-1 and RM-28.

Mitigation Measure BIO-1: Avoid Impacts to Special-status Plants

See discussion in IV.a for a description of this mitigation measure.

Mitigation Measure BIO-2: Avoid Impacts to Special-status Fish Species

See discussion in IV.a for a description of this mitigation measure.

Mitigation Measure BIO-3: Avoid Impacts to Foothill Yellow-legged Frogs

See discussion in IV.a for a description of this mitigation measure.

Mitigation Measure BIO-4: Avoid Impacts to Nesting Birds

See discussion in IV.a for a description of this mitigation measure.

Mitigation Measure BIO-5: Avoid Impacts to Roosting Bats

See discussion in IV.a for a description of this mitigation measure.

Mitigation Measure BIO-6: Tree Protection and Replacement Plan

See discussion in IV.b for a description of this mitigation measure.

Mitigation Measure BIO-7: Compensate for Impacts to Waters

See discussion in IV. B for a description of this mitigation measure.

Mitigation Measure HYD-1: Minimize Impacts to Mill Creek during Construction

See discussion in X.a,f for a description of this mitigation measure.

IV. f) Conflict with Conservation Plans – No Impact

No adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan exists for the Project area (CDFW 2019; USFWS 2018). No impact would occur.

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
V. Cultural Resources				
Would the Project:				
a. Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?			✓	
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?		✓		
c. Disturb any human remains, including those interred outside of formal cemeteries?		✓		

Discussion:

A site-specific Archaeological Survey Report (ASR) (GANDA 2013b) and Historic Property Survey Report (HPSR) (GANDA 2013c) were prepared for the Project to identify potential archaeological and historical resources within the Area of Potential Effects (APE, see Figure 4). An Addendum to the ASR was prepared in 2017 (GANDA 2017). The findings for the ASR and HPSR were based on the following research, consultations and analysis:

- A records search and historic map research at the Northwest Information Center (NWIC) of the California Historic Resources Inventory System at Sonoma State University, Rohnert Park;
- Contact with the Native American Heritage Commission, Native American groups and individuals;
- Mendocino County Historical Society information solicitation;
- A field survey of the Project APE; and
- Geoarchaeological analysis.

The findings of the ASR and HPSR are used as the basis for the analysis of potential impacts to historical and archaeological resources below.

V. a) Historical Resources – Less than Significant

The existing Mill Creek Bridge (Caltrans Bridge No. 10C0111) was the only historic-period resource identified within the Project APE (GANDA 2013b and 2013c). The bridge was constructed in 1925 and is listed in the online Caltrans Historic Bridge Inventory as ineligible for listing in the National Register of Historic Places (Status Code 5) (GANDA 2013b). Additionally, the bridge does not meet the California Historic Landmark eligibility criteria (GANDA 2013c). The Mendocino County Historical Society was also consulted regarding knowledge of any historical information or resources within the Project area. To date, no response has been received (GANDA 2013c). The impact on historical resources would be less than significant.

V. b,c) Archeological Resources or Human Remains – Less than Significant with Mitigation

The Project is situated within the ancestral territory of the Yuki Indians, whose native lands extended into the upper and the lower drainages of the Eel River system within the Coast Range Mountains. The Yukian culture was comprised of six tribal subdivisions, of which the *Ukomno'm* Yuki (valley people) occupied the southern end of the Round Valley region that includes the Project area. Round Valley, which was known as *Me-sha-kai* to the Yuki people, is surrounded by the Coast Range Mountains, which played a major role as part of the Yuki culture and environment (GANDA 2013b).

Background and archival research at the NWIC was conducted to compile information pertaining to the locations of previously recorded cultural resource sites and prior studies within the Project area. The records search did not identify any previously recorded archaeological sites within a 0.25-mile radius of the Project APE. Two cultural resources studies (one in 1966, another in 1978) were found to have been conducted within the Project APE. Neither of the cultural studies resulted in the identification of any cultural resources in the Project's APE (GANDA 2013b).

In addition to the records search, the State of California Native American Heritage Commission (NAHC) was asked to review their Sacred Lands file for information on Native American cultural resources in the study area. The NAHC indicated that the record search of the Sacred Lands File did not identify the presence of Native American cultural resources in the Project area (GANDA 2013b).

A list of people responsible for Native American concerns in the area was also notified of the proposed Project and asked if they had knowledge of any cultural resources in the Project area. Responses were received from Native American individuals associated with the following affiliations: Potter Valley Tribe (Pomo), Noyo River Indian Community (North Coastal Pomo), Stewarts Point Rancheria (Pomo), Wailaki, Yuki, and the Round Valley Indian Tribes of Covelo. The responses from individuals associated with the Potter Valley Tribe, Noyo River Indian Community, and Stewarts Point Rancheria indicated that the Project area was outside of their Pomo ancestral territories and that no known affiliated cultural resources are located within the Project's APE. The Wailaki representative indicated that the Project area is a fishing area where the tribe has been coming together for generations. Representatives of the Yuki and the Round Valley Indian Tribes of Covelo indicated that the Project is in an area sensitive for prehistoric archaeological resources.

A pedestrian survey of the Project's original APE was conducted by archaeologists on August 30, 2012. A second pedestrian survey was conducted to survey the additional 0.53-acre area added to the APE in 2016, which is contiguous to the original APE. The second survey was conducted on September 26, 2016. During the initial 2012 site visit, areas within the APE were surveyed, including the creek channel and the banks on the east and west sides of the bridge, and areas around the abutments of the bridge and all open ground within and alongside the APE (GANDA 2013b). Archaeologists reported that the ground visibility was good to moderate, approximately 50 to 70 percent, due to the presence of seasonal grasses, blackberry bushes, and poison oak, which reduced visibility and access in some areas off the access route and the banks of the creek (GANDA 2013b). During the 2016 survey, archaeologists stated the overall ground visibility within the 0.53-acre area varied between 0 to 60 percent due to pavement, leaf litter and dense vegetation. No prehistoric or historic-period deposits or artifacts were identified during either survey (GANDA 2017).

Archaeologists also reviewed the results of geological boring data previously completed at the Project site to assess the sensitivity of the APE for buried prehistoric archaeological resources. The age of the geological deposits underlying portions of the APE date to the Pliocene-Pleistocene (5.3 million years ago to 12,000 years before present) non-marine sedimentary deposits on the west side of the channel, which are too old to contain buried prehistoric archaeological deposits. The surface materials within the stream channel are mapped as unconsolidated Holocene aged (12,000 years before present to the present)

alluvium that consists of sand, gravel, and lesser silt/clay. These deposits at the surface are the result of high energy stream channel deposition and the soils are not well developed, meaning that they have little potential to contain intact prehistoric deposits (GANDA 2013b). However, the age of the Holocene aged deposits underlying much of the APE do have the potential to contain buried prehistoric deposits (GANDA 2013b).

While no archaeological resources have been identified within the APE, the presence of numerous prehistoric archaeological sites within a mile of the APE, the location of the APE extending across both banks of Mill Creek, and correspondence with interested Native American groups and individuals, indicates that the APE is sensitive for prehistoric and/or contact period archaeological resources at or near the surface. In addition, there is a moderate potential for the presence of buried prehistoric deposits where the APE is underlain by Holocene aged deposits on the east side of Mill Creek. Therefore, the potential impact to archaeological resources is considered significant, given the potential for unanticipated discoveries to occur during ground-disturbing activities. The potential impact to human remains is also considered significant, given the potential for unanticipated discoveries to occur during ground-disturbing construction activities.

Mitigation Measure CR-1: Identify and Avoid or Minimize Impacts to Unknown Cultural Resources

Mendocino County shall retain a qualified archaeologist to be present during initial ground disturbing activities to ensure that there are no prehistoric archaeological resources present within the vertical APE. These activities would include excavation of the existing concrete abutments, headwalls, and associated footings from the creek.

If archaeological materials are encountered during construction activities, construction crews shall stop all work within 100 feet of the discovery until a qualified archaeologist can assess the discovery and provide recommendations. Such treatment and resolution could include modifying the Project to allow the materials to be left in place, or undertaking data recovery of the materials in accordance with standard archaeological methods. The preferred treatment of the resource is protection and preservation.

Resources could include buried historic features, such as artifact-filled privies, wells, and refuse pits, and artifact deposits, along with concentrations of adobe, stone, or concrete walls or foundations, and concentrations of ceramic, glass, or metal materials. Native American archaeological materials could include obsidian and chert flaked stone tools (such as projectile points and knives), midden (darken soil created culturally from use and containing heat-affected rock, artifacts, animal bones, or shellfish remains), and/or groundstone implements (such as mortars and pestles). Project personnel shall not collect cultural materials.

Mitigation Measure CR-2: Procedures for Encountering Human Remains

If human remains are encountered as a result of construction activities, any work in the vicinity shall stop and the Mendocino County Coroner shall be contacted immediately. In addition, a qualified archaeologist shall be contacted immediately to evaluate the discovery, if a monitor is not already present. If the human remains are Native American in origin, then the Coroner shall notify the Native American Heritage Commission within 24 hours of this identification, pursuant to Public Resources

Code 5097.98. California Health and Safety Code Section 7050.5 states that it is a misdemeanor to knowingly disturb a human grave.

Mitigation Measure CR-1 would reduce the impact to archaeological resources that may be encountered during construction by protecting, preserving, or recovering any significant resources. Mitigation Measure CR-2 would reduce the impact from discovery of human remains by providing standard procedures in the event that human remains are encountered and requiring adherence to Public Resources Code Section 5097.98 requiring Native American tribal notification. The impact to potentially unknown archaeological resources or human remains following mitigation would be less than significant.

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
VI. Energy				
Would the Project:				
a. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?			✓	
b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?			✓	

VI. a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

Construction of the Project would involve grading, excavation, and use of heavy machinery as discussed under Section III. Construction would require the use of fuels, primarily gas, diesel, and motor oil. The precise amount of construction-related energy consumption that would occur is uncertain. However, construction would not require a large amount of fuel or energy usage because of the moderate number of construction vehicles and equipment, worker trips, and truck trips that would be required for a project of this scale. Construction equipment would remain staged in the Project area once mobilized. . Excessive idling and other inefficient site operations would be prohibited. Equipment idling times would be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes or less (as required by the California airborne toxics control measure (Title 13, Section 2485 of the CCR). Therefore, construction would not result in the use of large amounts of fuel and energy in a wasteful manner, and the impact would be less than significant.

Following construction, no additional energy would be required in order for bridge operation to occur. Therefore, the Project would not result in wasteful, inefficient or unnecessary consumption of energy resources. No operational impact would result.

VI. b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

In 2003, the California Energy Commission (CEC), the California Power Authority (CPA), and the California Public Utilities Commission (CPUC) jointly adopted an Energy Action Plan (EAP) that listed goals for California's energy future and set forth a commitment to achieve these goals through specific actions (CEC 2003). In 2005, the CPUC and the CEC jointly prepared the EAP II to identify the further actions necessary to meet California's future energy needs. Additionally, the CEC prepared the State Alternative Fuels Plan in partnership with the California Air Resources Board and in consultation with the other state, federal, and local agencies. The alternative fuels plan presents strategies and actions California must take to increase the use of alternative non-petroleum fuels in a manner that minimizes costs to California and maximizes the economic benefits of in-state production (CEC 2005).

Locally, the *Mendocino County General Plan* includes policies to promote energy conservation in the County (Policy RM-52, RM-54, and RM-57) and to increase use of renewable energy resources (Policies RM-53, RM—55, RM-56, and RM-58).

Construction and operation of the Project would not conflict with or obstruct implementation of either the EAP, EAP II, the State Alternative Fuels Plan or local County general plan goals. Project construction would not require a large amount of fuel or energy usage because of the limited extent and nature of the proposed improvements and the minimal number of construction vehicles and equipment, worker trips, and truck trips that would be required for a project of this small scale. Project operation would not require additional energy use beyond existing conditions. No conflicts with a state or local plan for renewable energy or energy efficiency have been identified. Therefore, no impact would result.

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
VII. Geology and Soils				
Would the Project:				
a)Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
a.i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.				✓
a.ii. Strong seismic ground shaking?		✓		
a.iii. Seismic related ground failure, including liquefaction?		✓		
a.iv. Landslides?		✓		
b. Result in substantial soil erosion or the loss of topsoil?			✓	
c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on, or off, site landslide, lateral spreading, subsidence, liquefaction or collapse?		✓		
d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?			✓	
e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?				✓
f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?		✓		

Discussion:

VII. a.i) Fault Rupture – No Impact

The Project site is not underlain by a known earthquake fault and is not located within or adjacent to an Alquist-Priolo Earthquake Fault Zone (Blackburn Consulting 2012). Therefore, no impact from rupture of a known fault would occur.

VII. a.ii) Strong Ground Shaking – Less than Significant with Mitigation

As noted in the Project Description, the existing bridge is structurally deficient. Therefore, replacement of the bridge would have a beneficial effect.

According to a site-specific geotechnical study prepared for the Project, the nearest known active fault system is the Bartlett Springs fault, located approximately 1.73 miles away (Blackburn Consulting 2012). The geotechnical study assigned the site a Peak Ground Acceleration (PGA) of 0.65g, upon which the design spectrum is then based (Blackburn Consulting 2013). The potential impact from strong groundshaking would be significant, given that the shaking could expose the new bridge to substantial adverse effects.

Mitigation Measure GEO-1: Implement Geotechnical Recommendations

The Project shall be designed and constructed in conformance with the specific foundation recommendations contained in the design-level geotechnical study prepared for the Project. The recommendations made in the geotechnical study shall be incorporated into the final plans and specifications and implemented during construction. These recommendations include, but would not be limited to, the use of standard Caltrans steel pipe piles, driven open-ended, and sized to provide sufficient structural capacity to resist downdrag loads from liquefaction-induced settlement and provide resistance to lateral forces due to liquefaction-induced lateral spreading.

Mitigation Measure GEO-1 would reduce the impact to people and Project structures from strong seismic ground shaking by requiring design and construction in conformance with specific recommendations contained in geotechnical study. While proper engineering design and construction in conformance with building codes and seismic standards does not constitute any kind of guarantee that significant structural damage would not occur in the event of a maximum magnitude earthquake, it is reasonable to expect that a well-designed and well-constructed structure would not collapse or cause loss of life in a major earthquake. Therefore, geologic impacts on people or structures related to seismic ground shaking following mitigation would be less than significant.

VII. a.iii) Seismic Related Liquefaction – Less than Significant with Mitigation

Liquefaction is a phenomenon in which saturated granular sediments temporarily lose their shear strength during periods of earthquake-induced, strong ground shaking. Based on the results of the geotechnical study, potentially liquefiable soils are present in a 12-foot thick soil zone extending from the west bank into the channel. The potential impact from seismic related liquefaction is considered significant.

Mitigation Measure GEO-1: Implement Geotechnical Recommendations

See discussion of VII.a.ii above for a description of this mitigation measure.

Mitigation Measure GEO-1 (Implement Geotechnical Recommendations) would reduce the impact to people and Project structures from seismic related liquefaction by requiring design and construction in conformance with specific recommendations contained in geotechnical study. Therefore, geologic impacts on people or structures related to seismic related liquefaction following mitigation would be less than significant.

VII. a.iv) Landslides – Less than Significant with Mitigation

In the vicinity of the bridge, the natural creek banks slope at about 2:1 (H:V) or slightly steeper. The site-specific geotechnical study identified a 12-foot thick potentially liquefiable soil zone extending from the west bank into the channel. The potential impact from seismic related landslides or slope instability is considered significant.

Mitigation Measure GEO-1: Implement Geotechnical Recommendations

See discussion of VII.a.ii above for a description of this mitigation measure.

Mitigation Measure GEO-1 would reduce the impact to people and Project structures from landslides by requiring design and construction in conformance with specific recommendations contained in geotechnical study. Therefore, geologic impacts on people or structures related to landslides following mitigation would be less than significant.

VII. b) Loss of Top Soil – Less than Significant

Construction activities could result in a small localized loss of top soil. However, such losses of top soil would be negligible. Consequently, no substantial loss of topsoil due to erosion or grading is anticipated and the impact would be less than significant.

Construction impacts to water quality associated with soil erosion are further addressed in Section IX, Hydrology and Water Quality.

VII. c) Unstable Soils – Less than Significant with Mitigation

The site-specific geotechnical study identified a 12-foot thick potentially liquefiable soil zone extending from the west bank into the channel. The potential for settlement due to liquefaction was estimated at about 6 inches at the west bank and little to no seismic settlement at the east abutment. The potential for seismic settlement, slope instability, and liquefaction associated with unstable soils at the Project site is considered significant.

Mitigation Measure GEO-1: Implement Geotechnical Recommendations

See discussion of VII.a.ii above for a description of this mitigation measure.

Mitigation Measure GEO-1 would reduce the impact to people and Project structures from unstable soils by requiring design and construction in conformance with specific recommendations contained in geotechnical study. Therefore, geologic impacts on people or structures related to unstable soils following mitigation would be less than significant.

VII. d) Expansive Soils – Less than Significant

The soils mapped within the Project's APE (see Figure 4) include Xerofluvents, 0 to 2 percent slopes, and the Xerochrepts-Haploxeralfs-Argixerolls complex, 9 to 30 percent slopes (United States Department of Agriculture 2013). The shrink-swell potential of Xerofluvents, 0 to 2 percent slopes, is considered low (i.e., linear extensibility of less than 3 percent), while the shrink-swell potential of the Xerochrepts-Haploxeralfs-Argixerolls complex ranges from low to high (i.e., linear extensibility ranging from less than 3 percent to 9 percent) (United States Department of Agriculture 2013). However, the bridge supports would not be affected by the natural shrinking and swelling of local soils because steel piles would be driven into bedrock to a total depth of up to 80 feet. The steel piles would provide a foundation for the bridge in an area not subject to shrinking and swelling. Therefore, the potential impact from expansive soils would be less than significant.

VII. e) Septic Tanks – No Impact

No septic tanks or wastewater disposal systems are proposed as part of the Project. No impact would occur.

VII.d) Unique Paleontological Resource or site or unique geologic feature- Less than significant with Mitigation

Paleontological resources are the remains or traces of prehistoric animals and plants. A search of geologic documents and the University of California Museum of Paleontology (UCMP) database was performed for the Project by Kenneth L. Finger, Ph.D., to assess the potential for paleontological resources or paleontologically-sensitive geologic units at the Project site.

Geologic mapping shows the surficial geology of the Project area comprises Cretaceous Franciscan Formation, Plio-Pleistocene non-marine deposits, and Recent alluvium (Finger 2013). The Franciscan Formation is a metamorphic complex that is not paleontologically sensitive and Recent alluvium is too young to have any paleontological potential (Finger 2013). Nonmarine Plio-Pleistocene sediments have a high paleontological sensitivity. However, their paleontological potential is low, because such occurrances are spotty and generally unpredictable (Finger 2013). In addition, the UCMP database search found no Plio-Pleistocene, Pliocene, or Pleistocene vertebrate localities recorded for Mendocino County (Finger 2013).

Although it is unlikely that Project construction would impact potentially significant paleontological resources, it cannot be ruled out altogether. Therefore, the potential impact is considered significant.

Mitigation Measure GEO-2: Evaluation and Treatment of Paleontological Resources

If paleontological resources (e.g., vertebrate bones, teeth, or abundant and well-preserved invertebrates or plants) are encountered during construction, Mendocino County shall ensure work in the immediate vicinity shall be diverted away from the find until a professional paleontologist assesses and salvages the find, if necessary.

Mitigation Measure GEO-2 would reduce potential impacts to paleontological resources by requiring evaluation and salvage of any paleontological resources found during construction. The impact to paleontological resources following mitigation would be less than significant.

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
VIII. Greenhouse Gas Emissions				
Would the Project:				
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			✓	
b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?				✓

Discussion:

VIII. a) Generation of Greenhouse Gas Emissions – Less than Significant Impact

There is currently no applicable federal, State, or local threshold pertaining to construction-related greenhouse gas (GHG) emissions and the BAAQMD CEQA Guidelines [used by the Mendocino County Air Quality Management District] do not include screening criteria or significance thresholds for construction. Therefore, this analysis uses a qualitative approach in accordance with Section 15064.4(a)(2) of the CEQA Guidelines.

During construction, GHG emissions would be generated from construction equipment. However, construction would last for only eight months and would be less intensive than traditional land use development that requires a larger fleet of earthmoving equipment or soil off hauling and/or delivery and similar such equipment. Project emissions during construction would not be a considerable contribution to the cumulative GHG impact, given that construction would be temporary (i.e., eight months), and the size and nature of construction is not considered to result in significant air quality impacts (see Section III, Air Quality). Therefore, the impact to GHG emissions during construction is considered less than significant.

Following construction, the Project would not result in a new source of GHG emissions, would not increase the vehicle capacity of Hill Road, and would not induce population growth in the area. Therefore, no long-term impact to GHG emissions would occur.

VIII. b) Conflict with an Applicable Plan, Policy, or Regulation – No Impact

The County of Mendocino has adopted several GHG emission reduction policies and action items as part of the 2009 General Plan (County of Mendocino 2009). General Plan Action Item DE-65.2 directs the County to work cooperatively with industrial facilities to identify greenhouse gas impacts from their operations and develop a long-term plan for reducing emissions. Because the Project is not a type of industrial development, Action Item DE-65.2 would not apply to the Project.

Mendocino County General Plan Policy RM-43 and Action Items RM-43.1 through RM-43.3 direct the County to create an inventory of existing and historical GHG emissions, to create a GHG reduction plan, and to reduce the County's GHG footprint. As of the date this analysis was completed, the County had not completed such an inventory and had not developed a GHG reduction plan (County of Mendocino 2013). The Project would therefore not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases. Additionally, as described above in Impact VIII.a, the

Project would not result in a new source of long-term GHG emissions, would not increase the vehicle capacity of Hill Road, and would not induce population growth in the area. No impact would occur.

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
IX. Hazards and Hazardous Materials				
Would the Project:				
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?		✓		
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			✓	
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				✓
d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?				✓
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project result in a safety hazard or excessive noise for people residing or working in the Project area?				✓
f. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?			✓	
g. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?			✓	

Discussion:

IX. a) Use and Disposal of Hazardous Materials – Less than Significant with Mitigation

An asbestos and lead paint survey was performed on the existing bridge in 2013 (GHD 2013). The survey included collection of two bulk samples of suspect asbestos-containing materials, the analysis of which did not identify asbestos. The survey also included lead-based paint testing and paint chip sampling for the purpose of characterizing the general presence of lead in existing paints and coatings on the bridge. None of the representative painted surfaces tested contained lead levels above the lead-based paint threshold of 1.0 mg/cm^2, 5,000 ppm, or 0.5 percent by weight, as set forth in the U.S. Department of Housing and Urban Development (HUD) guidelines and California Department of Public Health. However, the painted components tested had detectable levels of lead and would need to be considered lead-containing paint coated materials. If not handled and disposed of properly, the disturbance of these components during

demolition activities may result in a hazard to the public or environment. The impact is considered potentially significant.

Mitigation Measure HAZ-1a: Health and Safety Plan

The construction contractor shall, prior to construction, prepare a site-specific health and safety plan in accordance with Cal-OSHA regulations (8 CCR Title 8, Section 5192) to address worker health and safety issues during construction. The health and safety plan shall mandate compliance with Cal-OSHA regulations governing occupational exposure to lead (Title 8, CCR, Section 1532.1). The health and safety plan shall identify the potentially present chemicals, health and safety hazards associated with those chemicals, all required measures to protect construction workers and the general public from exposure to harmful levels of any chemicals identified at the site (including engineering controls, monitoring, and security measures to prevent unauthorized entry to the work area), appropriate personal protective equipment, and emergency response procedures.

Mitigation Measure HAZ-1b: Hazardous Materials Management Plan

The construction contractor shall prepare a hazardous materials management plan that specifies the method for handling and disposal of hazardous materials during construction, including disposal of lead-containing paint waste. Contract specifications shall mandate full compliance with all applicable local, State, and federal regulations related to identifying, transporting, and disposing of hazardous materials, including lead containing/contaminated materials. The contractor shall provide the County with copies of hazardous waste manifests documenting that disposal of any hazardous materials has been performed in accordance with the law.

Mitigation Measures HAZ-1a and HAZ-1b would reduce the potential impact associated with disturbance of lead-containing materials during demolition activities by requiring preparation of a site health and safety plan to protect construction worker health and safety and a hazardous materials management plan to ensure that hazardous wastes encountered during project construction are transported and disposed of in a safe and lawful manner. Therefore, the potential hazardous materials impact on the public or environment following mitigation would be less than significant.

IX. b) Accident Conditions – Less than Significant

Project construction activities would include the use of typical hazardous materials, such as fuels, lubricants, paints and solvents. Routine transport and use of such hazardous materials during construction could result in an incremental increase in the potential for accidents. However, numerous laws and regulations ensure the safe transportation and use of hazardous materials. For example, Caltrans and the California Highway Patrol (CHP) regulate the transportation of hazardous materials and wastes, including container types and packaging requirements, as well as licensing and training for truck operators, chemical handlers, and hazardous waste haulers. Worker safety regulations cover hazards related to the prevention of exposure to hazardous materials and a release to the environment from hazardous materials use. Cal-OSHA also enforces hazard communication program regulations, which contain worker safety training and hazard information requirements, such as procedures for identifying and labeling hazardous substances, communicating hazard information related to hazardous substances and their handling, and preparation of health and safety plans to protect workers and employees. Because contractors would be required to comply with existing and future hazardous materials laws and regulations covering the transport, use and

disposal of hazardous materials, the impacts associated with the potential to create a significant hazard to the public or the environment would be less than significant.

The potential to encounter hazardous materials in soil or groundwater at the Project site would be low, given that there are no past or current land uses in the Project area known to have resulted in leaking fuel or chemical storage tanks or other releases of hazardous materials. In addition, as discussed in Air Quality Impact III.d, naturally occurring asbestos was not encountered in site-specific test borings and is not reported to occur at the site based on geologic mapping. Therefore, no human exposure to naturally occurring asbestos is anticipated to occur.

Following construction, there would be no features included in the Project that would, by their nature or design, utilize or generate hazardous materials or wastes. No impact would occur.

IX. c) Emit Hazardous Emissions within One-Quarter Mile of a School – No Impact

No schools are located within one-quarter mile of the Project site. No impact would occur.

IX. d) Included on a List of Hazardous Materials Sites – No Impact

The Hazardous Waste and Substances Sites List (Cortese List) is a planning document used to comply with CEQA requirements for providing information about the location of hazardous materials release sites. A search of the data resources that provide information regarding the facilities or sites identified as meeting the "Cortese List" requirements was completed to determine if any known hazardous waste facilities exist on or adjacent to the Project site (EDR 2013, SWRCB 2017, DTSC 2017). The review indicates that the Project is not located on a site included on any list compiled pursuant to Section 65962.5 of the Government Code. In addition, review of historical topographic maps did not indicate past development at or near the site that would indicate the potential presence of hazardous wastes. No impact would occur.

IX. e) Safety Hazard for People Residing or Working Within Two Miles of an Airport – No Impact

The nearest public or private airport to the Project site is the Round Valley Airport, located approximately 5 miles to the northwest. The Project site is not located within the referral area or land use plan for the Round Valley Airport (Mendocino County 2009), or within the vicinity of a private air strip. Therefore, no air-traffic related impact would occur.

IX. f) Impair or Interfere with an Adopted Emergency Response/Evacuation Plan – Less than Significant

The County of Mendocino's 2016 Emergency Operations Plan includes and identifies emergency planning, organization, policies, procedures, and response to extraordinary emergency situations associated with natural disasters, technological incidents, and national security emergencies (Mendocino County 2016).

During construction, the existing bridge crossing would be closed to vehicles for approximately eight months. During this time, Hill Road on the east and west side of the bridge would remain open to travel and would be available for evacuation purposes of local areas in the event of an emergency. The Project would not affect major evacuation routes in the area, such as State Route 162. The temporary impact would therefore be less than significant.

IX. g) Exposure to Wildland Fires – Less than Significant

According to maps prepared by the California Department of Forestry and Fire Protection (CAL FIRE), the Project area and immediately adjacent lands are designated as being within a “Moderate” fire hazard severity zone (CAL FIRE 2007a and 2007b). The Project site is not located within a “high” or “very high” fire hazard zone. Therefore, the potential for construction activities to expose people or structures to a significant risk of loss, injury or death involving wildland fires is considered less than significant.

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
X. Hydrology and Water Quality				
Would the Project:				
a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?		✓		
b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?			✓	
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:			✓	
i. result in substantial erosion or siltation on- or off-site?		✓		
ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;		✓		
iii. create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or		✓		
d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?				✓
e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?			✓	

Discussion:

X. a) Violate Water Quality Standards or Substantially Degrade Water Quality – Less than Significant with Mitigation

The Project is located within the Eel River Hydrologic Unit, Middle Fork Hydrologic Area, Round Valley Hydrologic Sub-Area (NCRWQCB 2011). The Round Valley Hydrologic Sub-Area is listed on the 2010 Clean Water Act Section 303(d) list of water quality limited segments for sedimentation/siltation, temperature, and aluminum (U.S. EPA 2011).

Construction activities within and adjacent to Mill Creek would temporarily disturb local soils and could result in erosion if not properly controlled and repaired. Construction could also be a source of chemical contamination from use of alkaline construction materials (e.g., concrete, mortar, hydrated lime) and hazardous or toxic materials, such as fuels. Construction activities would be implemented in accordance with Caltrans 2018 Standard Specifications Water Quality Control Section 13-4.03E(9), however the

potential still exists for construction-related activities to result in turbidity levels or chemical contamination that may violate water quality standards and degrade water quality. The impact is, therefore, considered significant.

Construction activities would require removal of some riparian vegetation. As described in the Project Description, following construction, disturbed areas will be re-vegetated with fast-growing native plants, including locally-sourced willow cuttings, along with commercial hydraulic mulching materials. Project re-vegetation, along with implementation of Mitigation Measure BIO-6 (Tree Protection and Replacement Plan), would reduce the Project's impact on temperature in the Round Valley Hydrologic Sub-Area to a less-than-significant level.

Mitigation Measure HYD-1: Minimize Impacts to Mill Creek during Construction

MDOT or its contractor(s) shall prepare an Erosion and Sediment Control Plan prior to construction and implement it during construction to minimize impacts to Mill Creek during Project construction. The Erosion and Sediment Control Plan shall include sufficient measures to address the overall construction of the Project and, at a minimum, construction contractors should undertake the following measures, as applicable, to minimize any adverse effects on water quality:

- The amount of construction-related disturbance within the Mill Creek channel and creek banks shall be limited to the extent practicable.
- Where the creek channel is contoured to accommodate the new bridge, modifications to the existing stream banks shall provide a smooth transition into and out of the modified stream section.
- Other disturbed stream banks shall be returned to pre-existing contours and natural conditions upon completion of work.
- Construction equipment shall be cleaned and inspected prior to use. Servicing of vehicles shall be conducted a minimum of 100 feet from Mill Creek, at designated staging areas to avoid contamination through accidental drips and spills.
- The Project shall comply with the Caltrans Construction Site BMP Manual section NS-13: Material and Equipment Use Over Water.
- Dust, erosion, sedimentation control, and dewatering activities shall follow the 2018 Caltrans Standard Specifications.
- On-site stockpiles shall be isolated with silt fence, filter fabric, and/or straw bales/fiber rolls. Silt fence and/or fiber rolls shall be placed at bridge abutments, new abutment excavation areas, and any other locations when work could result in loose sediment that could enter stream. The silt fence/fiber rolls shall be maintained and kept in place for the duration of the Project. Any sediment or debris captured by the fence/rolls shall be removed before the fence/rolls are pulled. As necessary additional erosion, sediment, and material stockpile BMPs shall be employed between work areas and adjacent waterway. No fill or runoff shall be allowed to enter the waterway.
- The construction zone shall be kept free from litter by providing suitable disposal containers for trash and all construction-generated material wastes. These containers shall be emptied at regular intervals and the contents properly disposed. The containers shall have covers that can be completely closed and secured.

- Hazardous materials shall be stored in an area protected from rainfall and stormwater run-on to prevent the offsite discharge of leaks or spills.
- Portable sanitary facilities shall be located a minimum of 50 feet from the creek and maintained regularly to prevent the discharges of pollutants.

Mitigation Measure HWQ-2: Storm Water Control Measures during Construction

MDOT shall obtain coverage under State Water Resources Control Board Order No. 2009-0009-DWQ, Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction and Land Disturbance Activities, as amended by 2010-0014-DWQ and 2012-0006-DWQ. MDOT and/or its contractor shall submit permit registration documents (notice of intent, risk assessment, site maps, Storm Water Pollution Prevention Plan (SWPPP), annual fee, and certifications) to the State Water Resources Control Board. The SWPPP shall address pollutant sources, non-storm water discharges, best management practices, and other requirements specified in the above-mentioned Order. The SWPPP shall also include dust control practices to prevent wind erosion, sediment tracking, dust generation by construction equipment, management of concrete slurry, asphalt, pavement cutting, and other street and road activities to avoid discharge to storm drains from such work. The SWPP shall be prepared in accordance with Caltrans SWPPP and Water Pollution Control Program Preparation Manual (Caltrans 2016).A Qualified Storm Water Pollution Prevention Plan Practitioner shall oversee implementation of the Plan, including visual inspections, sampling and analysis, and ensuring overall compliance.

Mitigation Measure BIO-6: Tree Protection and Replacement Plan

See discussion in IV.b for a description of this measure.

Mitigation Measure BIO-7: Compensate for Impacts to Waters

See discussion in IV.b for a description of this measure.

Mitigation Measure HYD-1, HYD-2, and BIO-7 would reduce potential water quality impacts during Project construction to a less-than-significant level by requiring measures to control erosion and sedimentation of receiving water bodies and minimizing the risk of hazardous material release. Mitigation Measure BIO-6 would reduce potential impacts on temperature to a less-than-significant level by requiring tree protection measures and tree replacement to preserve existing riparian habitat.

X. b) Substantially Decrease Groundwater Supplies or Interfere with Groundwater Recharge – Less than Significant

During construction, temporary dewatering could be required if groundwater accumulates in an excavation area. Dewatering would occur via low flow diversion, diverting all water to the middle of the channel to allow work along the banks to be done in dry areas. The water would still be allowed to infiltrate either upstream or downstream from the diversion. No substantial lowering of the local groundwater table would occur from such temporary dewatering; therefore, the impact from construction dewatering is considered less than significant.

Following construction, there would be no features included in the Project that would, by their nature or design, utilize groundwater supplies or interfere with groundwater recharge. No impact would occur.

X. c i) Substantially Alter Drainage Patterns Resulting in Erosion or Siltation – Less than Significant

See Impact X.a above for an evaluation of the Project's construction-related impacts on erosion and siltation.

As described in the Project Description, after obtaining the engineered grade of the channel banks, RSP would be placed to armor and protect the channel banks from potential erosion. In addition, exposed and disturbed areas of the creek bank and construction area would be re-vegetated with fast-growing native plants, including locally-sourced willow cuttings, along with commercial hydraulic mulching materials. Therefore, following construction, the Project's long-term impact on erosion or siltation on- or off-site would be less than significant.

X. c ii) Substantially Increase Runoff Resulting in Flooding – Less than Significant

Following construction, drainage patterns would be substantially the same as existing conditions. The RSP to be placed on the channel banks would not interfere with normal channel flows. The Project would not result in new storm drain facilities and only negligible increases in impervious surfaces would occur from the widened roadway approaches. Therefore, the Project would not result in localized increases in the rate or amount of surface runoff that would result in flooding on- or off-site. The impact would be less than significant.

X. c iii) Exceed Capacity of Stormwater Drainages or Provide Additional Sources of Polluted Runoff – Less than Significant

See Impact X.c ii above for an evaluation of the Project's potential impacts due to localized increases in runoff.

Following construction, there would be no features included in the Project that would, by their nature or design, provide substantial sources of polluted runoff. RSP would be placed to armor and protect the channel banks from potential erosion, and exposed and disturbed areas of the creek bank and construction area would be re-vegetated with fast-growing native plants. The impact would be less than significant.

X. d) Inundation by Flood, Seiche, or Tsunami– No Impact

The bridge would be elevated above the 100-year flood elevation, therefore the Project would not result in the release of pollutants due to the Project site being inundated during a flood event. Tsunami inundation maps have been prepared for several coastal communities within Mendocino County. However, the Project is located inland in an area that is not subject to tsunami inundation. The potential for inundation by a seismic seiche is considered negligible, given the size of Mill Creek and the lack of large adjacent inland water bodies. In addition, no substantial slopes surround the Project area that would threaten the site with mudflows. Therefore, no impact from seiche, tsunami, or mudflows would occur.

See Impact VI.a.iv in the Geology and Soils Section for an evaluation of the potential impacts related to localized landslides.

X.e) Conflict or Obstruct Water Quality Control Plan or Sustainable Groundwater Management Plan – Less than Significant

The North Coast Regional Water Quality Control Board Basin Plan establishes thresholds for key water resource protection objectives for both surface waters and groundwater. Although the Project would replace the existing bridge over Mill Creek and install rip rap along the banks, it is not anticipated that the Project

would alter water quality parameters established in the Basin Plan. Erosion control BMPs would be required to be implemented during construction to prevent erosion and to protect overall water quality. The Project is located within a very low priority groundwater basin (No. 1-011), and the Project would not utilize groundwater beyond minimal construction dewatering (if required) (DWR 2019). No conflicts with an existing or foreseeable sustainable groundwater management plan have been identified. No impact would result.

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
XI. Land Use and Planning				
Would the Project:				
a. Physically divide an established community?			✓	
b. Cause a significant environmental impact due to a conflict with any applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?			✓	

Discussion:

XI. a) Physically Divide an Established Community – Less than Significant

The Project is located at the southeast edge of Round Valley, approximately 3.25 miles southeast of the Town of Covelo in northeastern unincorporated Mendocino County. The specific location of the Project is where Hill Road crosses Mill Creek, approximately 1.5 miles east of the intersection of Hill Road and Dobie Lane. During construction, the existing bridge crossing would be closed to vehicles for approximately eight months. Construction activities would be a temporary operation and would not cause a long-term impact on roadways. During construction, access to State Route 162 and to the Town of Covelo from residences located adjacent to the Project area on the east side of the bridge would be available by travelling north along Hill Road for 3.25 miles, then west on East Lane for another 3.25 miles. Residences located in the Project area on the west side of the bridge would be able to continue to use their normal route to State Route 162 (for example, Hill Road to Dobie Lane to Fairbanks Lane). This impact would be temporary in nature and would not physically divide the community. While neighboring residences on either side of the creek would temporarily lose direct access, access may still be gained by following the routes described above. Therefore, the impact would be less than significant.

Following construction, the Project would not physically divide an established community and would generally provide improved access. No impact would occur.

XI. b) Conflict with Applicable Land Use Plans, Policies or Regulations – Less than Significant

The Project would replace the existing single-lane bridge over Mill Creek with a new two-lane bridge, widened roadway approaches, and rock slope protection to stabilize the creek beneath the bridge. The Project would not cause a change in land use patterns and would be required to comply with the County's floodplain requirements in Chapter 20.120 of the County of Mendocino Municipal Code. Therefore, the potential for conflict with land use plans, policies, and regulations would be less than significant.

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
XII. Mineral Resources				
Would the Project:				
Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				✓
Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?				✓

Discussion:

XII. a, b) Result in the Loss of Availability of a Known Mineral Resource of Value to the Region or Delineated by a General Plan, Specific Plan or other Land Use Plan – No Impact

The Mendocino County General Plan identifies aggregate resources, primarily sand and gravel, as the predominant minerals found in the County. According to the General Plan, three sources of aggregate materials are present in Mendocino County: quarries, instream gravel, and terrace gravel deposits (Mendocino County 2009).

According to aggregate availability mapping compiled by the California Geological Survey, several aggregate mines are located in northern Mendocino County, indicating the presence of aggregate production areas (CDC 2012b). The State of California Geological Survey has not studied mineral resource zones in Mendocino County and no locally-important mineral resource recovery area is identified in the Mendocino County General Plan. Because the Project would consist of the improvement of a public road facility, no impact on potential aggregate resources would occur.

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
XIII. Noise				
Would the Project result in:				
a. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?		✓		
b. Generation of excessive ground borne vibration or ground borne noise levels?			✓	
c. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the Project area to excessive noise levels?				✓

Discussion:

The following discussion of noise impacts is informed by the Project's construction noise and vibration assessment report (see Appendix B)[1].

Existing Noise Environment and Sensitive Receptors

The Project is located in a rural area, approximately 3.25 miles southeast of the Town of Covelo. There are no major roadways in the vicinity; State Route 162 is located approximately 3.5 miles west of the Project. Given the rural nature of the surroundings, there are few sensitive receptors in the Project vicinity. The nearest sensitive receptors are single-family residences located approximately 200 feet to the northwest and south of the existing bridge. Other sensitive receptors in the Project vicinity include residences to the north, east, and west located approximately 500 to 600 feet from the Project site.

XIII. a) Exposure to Noise in Excess of Established Standards – Less than Significant with Mitigation

The following policies and regulations are relevant to operation of the Project. Mendocino County has not established quantitative noise limits or hours of operation for construction activities.

Mendocino County Noise Ordinance

The Mendocino County Zoning Code provides Exterior Noise Use Standards in Title 20, Division I, Appendix C, which are summarized in Table XIII-1 below. These standards would be applicable to operation of the Project.

1 Please see Appendix B for definitions of acoustical terms.

Table XIII-1 Exterior Noise Limit Standards (Levels Not to be Exceeded More than 30 minutes in any Hour)

Receiving Land Use Category [1, 2]	Time Period	Noise Level Standards (dBA) [3, 4]	
		Rural/Suburban	Urban/Highways[5]
One and two-family residential	10:00 pm – 7:00 am 7:00 am – 10:00 pm	50 40	60 50
Multi-family Public Spaces	10:00 pm – 7:00 am 7:00 am – 7:00 pm	45 55	50 60
Limited Commercial Some Multifamily	10:00 pm – 7:00 am 7:00 am – 10:00 pm	55 60	
Commercial	7:00 am – 10:00 pm 10:00 pm – 7:00 am	65 60	
Light Industrial	Any time	70	
Heavy Industrial	Any time	75	
Adjustments to Noise Level Standard			
L_{50}	30 min per hour	Standard	
L_{25}	15 min per hour	Standard + 5 dB	
L_0	Maximum permissible level	Standard + 20 dB	
Character	Tone, whine, screech, hum, or impulsive hammering, riveting or music or speech	Standard + 5 dB	
Ambient Level	Existing ambient L_{50}, L_{25}	Standard + 5 dB	
	Existing ambient L_0	Existing maximum	

Notes:
1. County staff shall recommend which receiving land use category applies to a particular project, based on the mix of uses and community noise levels. Industrial noise limits intended to be applied at the boundary of industrial zones, rather than within industrial areas.
2. The "rural/suburban" standard should be applied adjacent to noise sensitive uses such as hospitals or convalescence homes.
3. When an acoustical study demonstrates that ambient levels exceed the noise standard, then the ambient levels become the standard.
4. Higher noise levels may be permitted for temporary, short-term or intermittent activities when no sensitive or residential uses will be affected.
5. "Highways" apply to roads and highways where average daily traffic (ADT) exceeds ten thousand (10,000).

Mendocino County General Plan Noise Policies and Action Items

The following goals and policies established in the Mendocino County General Plan are applicable to operation of the Project.

Policy DE-98: The County will protect residential areas and other noise-sensitive uses from excessive noise by doing the following:

3) Requiring that County decisions which would cause or allow an increase in noise created by stationary or mobile sources (such as development of noise-generating land uses or the

construction of new or wider roadways) be informed by a noise analysis and accompanied by noise reduction measures to keep noise at acceptable levels.

Policy DE-99: To implement Policy DE-98, the following shall apply:

4) The County shall ensure that roadway projects include mitigation measures to maintain at least "tentatively compatible" noise levels as shown in Policy DE-101. Mitigation for roadway noise may be deferred where "tentatively compatible" noise guidelines would be exceeded on vacant lands, but shall be installed as part of the roadway project where the noise would affect existing homes. Deferred mitigation shall be the responsibility of the project which places residential units on vacant lands.

Policy DE-101: The following are noise compatibility guidelines for use in determining the general compatibility of planned land uses:

Noise Compatibility Guidelines (Expressed as a 24-Hour Day-Night Average or Ldn)

Land Use	*Completely Compatible*	*Tentatively Compatible*	*Normally Incompatible*	*Completely Incompatible*
Residential	*Less than 55 dBA*	*55-60 dBA*	*60-75 dBA*	*Greater than 75 dBA*
Commercial	*Less than 65 dBA*	*65-75 dBA*	*75-80 dBA*	*Greater than 80 dBA*
Industrial	*Less than 70 dBA*	*70-80 dBA*	*80-85 dBA*	*Greater than 85 dBA*

- *These guidelines apply to land designated by this General Plan for these uses. Residential, retail, or public parks which have been developed on land designated for other uses shall be subject to the exterior noise guidelines for the land on which they are located.*
- *Non-residential uses located on residentially designated land shall be subject to the exterior noise guidelines for residential lands.*
- *All uses on Commercial lands, including non-commercial uses, shall be subject to the standards for Commercial land.*

Policy DE-105: A 5 decibel (dB) increase in CNEL or L_{dn} noise levels shall be normally considered to be a significant increase in noise.

Caltrans Construction Noise Standards

Section 14-8.02 (Noise Control) of the Caltrans Standard Specifications is relevant to Project construction. The specification states:

- Control and monitor noise resulting from work activities.
- Do not exceed 86 dBA at 50 feet from the job site activities from 9 p.m. to 6 a.m.

Project Impacts

Construction

General Plan policies are generally considered to apply to long-term operational land uses and not to construction activities. Additionally, the County has not established quantified construction noise limits or allowable construction hours. For these reasons, these regulations are not applicable to Project

construction. However, the Project is still in compliance with Policy DE-98 because a noise analysis has been prepared for the Project.

Caltrans standards state that construction must not exceed 86 dBA at 50 feet during nighttime hours of 9:00 pm to 6:00 am. Because the Project description specifies that construction would be restricted to daytime hours, the Caltrans nighttime construction noise thresholds would not apply. It is not known if the Project construction equipment would be in compliance with Caltrans internal combustion specifications. If non-compliant construction equipment were used, this would be a significant impact. Implementation of Mitigation Measure NO-1 would reduce impacts to less-than-significant levels by requiring the use of Caltrans-compliant equipment. Mitigation Measure NO-1 would further reduce potential noise impacts by requiring implementation of other noise-reduction measures, such as further restricting construction hours, limiting unnecessary noisy idling, and requiring distribution of a noise-generating construction schedule to nearby sensitive receptors.

Mitigation Measure NO-1: Reduce Construction Noise

To reduce the potential for construction noise impacts, the following measures shall be implemented during Project construction.

- Noise-generating construction activities shall be restricted to the hours of 8:00 am to 6:00 pm Monday through Friday. No construction activities should occur on weekends or holidays. If work is necessary outside of these hours, Mendocino County shall require the contractor to implement a construction noise monitoring program and, if feasible, provide additional mitigation as necessary (in the form of noise control blankets or other temporary noise barriers, etc.) for affected receptors.
- Locate stationary noise generating equipment as far as possible from sensitive receptors when sensitive receptors adjoin or are near the active construction area.
- Utilize "quiet" air compressors and other "quiet" equipment where such technology exists.
- Require all construction equipment to conform to Section 14-8. 02, Noise Control, of the latest Caltrans Standard Specifications.
- The contractor shall prepare a detailed construction plan identifying the schedule for major noise-generating construction activities and distribute this plan to adjacent noise-sensitive receptors. The construction plan shall also list the construction noise reduction measures identified above.

Operation

As discussed in Section XV, Transportation and Circulation, the Project does not include new development that would result in increased traffic. The roadway widening is incidental to the bridge replacement and not intended to increase the vehicle capacity of Hill Road. Therefore, changes in existing traffic-generated noise are not anticipated and operation of the Project would not result in increased noise levels that could conflict with the County noise ordinance or General Plan policies DE-99, DE-101, or DE-105. Impacts would be less than significant.

XIII. b) Exposure to Groundborne Vibration or Noise – Less than Significant

For structural damage, Caltrans uses a vibration limit of 0.5 inches/second, peak particle velocity (in/sec, PPV) for buildings structurally sound and designed to modern engineering standards, 0.3 in/sec, PPV for older residential buildings, 0.25 for historic and some old buildings, and a conservative limit of 0.08 in/sec,

PPV for historic buildings or buildings that are documented to be structurally weakened (Caltrans 2013). All buildings in the Project vicinity are assumed to be structurally sound, but these buildings may or may not have been designed to modern engineering standards. No historic buildings or buildings that are documented to be structurally weakened are present in the construction area, and none are known to exist in the Project area. Therefore, the threshold of 0.3 in/sec, PPV for older residential buildings is conservatively assumed for this analysis.

The only significant source of ground vibration associated with the Project would result from impact pile driving. Table XIII-2 (following) presents typical vibration levels that could be expected from construction equipment at a distance of 25 feet. Given the small size of the piles and the overall range of piles, the "typical" values shown in Table XIII-2 would provide a credible worst-case level for anticipated pile driving vibration. A review of the vibration source level data indicates that vibration levels expected from Project construction would typically range from 0.003 in/sec PPV to 0.644 in/sec PPV at a distance of 25 feet for the vast majority of proposed construction activities (Illingworth & Rodkin 2017).

Vibration levels are highest close to the source. The use of an impact pile-driving hammer is expected to result in levels of 0.065 in/sec, PPV at the nearest residences approximate 200 feet from the construction site. Therefore, vibration levels would not exceed the 0.3 in/sec PPV threshold and would not be expected to cause cosmetic damage at the nearest residences. Impacts would be less than significant.

Table XIII-2 Vibration Source Levels for Construction Equipment

Equipment		PPV at 25 ft. (in/sec)
Pile Driver (Impact)	upper range	1.158
	typical	0.644
Clam shovel drop		0.202
Hydromill (slurry wall)	in soil	0.008
	in rock	0.017
Vibratory Roller		0.210
Hoe Ram		0.089
Large bulldozer		0.089
Caisson drilling		0.089
Loaded trucks		0.076
Jackhammer		0.035
Small bulldozer		0.003

XIII. c) Exposure of People Residing or Working near an Airport or Private Airstrip to Excessive Noise Levels – No Impact

The Project site is not located within an airport land use plan, within two miles of a public airport, or within the vicinity of an active private airstrip (Mendocino County Airport Land Use Commission 1996). Therefore, no impact from air-traffic related noise would occur.

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
XIV. Population and Housing				
Would the Project:				
a. Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?				✓
b. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?				✓

Discussion:

XIV. a) Induce Substantial Population Growth – No Impact

The Project would not induce substantial population growth in the area. The Project would replace a structurally deficient bridge, slightly widen roadway approaches on either side of the bridge, and stabilize the creek bank beneath the bridge. The roadway widening is not intended to increase the vehicle capacity of Hill Road and no additional travel lanes are proposed along Hill Road. The Project would not induce population growth in the area. No impact would occur.

XIV. b) Displace Housing or People – No Impact

Approximately 0.13 acre of permanent right-of way would be acquired as part of the Project. However, the Project would not displace existing housing or people and would not require construction of replacement housing elsewhere. No impact would occur.

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
XV. Public Services				
Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
a. Fire protection?				✓
b. Police protection?				✓
c. Schools?				✓
d. Parks?				✓
e. Other public facilities?				✓

Discussion:

XV. a, b) Impacts Associated with New or Altered Fire and Police Facilities – No Impact

Construction activities are not anticipated to adversely affect established service ratios for fire protection or emergency services. Potential incidents requiring fire protection, emergency services, or law enforcement could occur during construction. Also, the Project site is essentially halfway along the "loop" formed by Hill Road in the area. The length of time to access the Project site for the west or the east would be similar. Therefore, any increase in incidents or response times as a result of construction activities is anticipated to be negligible and could be accommodated by existing service providers.

Following construction, the Project would not induce population growth in the area. Therefore, the Project would not impose additional demands on fire or police services that would require new or physically altered facilities in order to maintain acceptable service ratios, response times, or other performance objectives. No impact would occur.

XV. c, d, e) Impacts Associated with New or Altered Schools, Parks, or Other Public Facilities – No Impact

Construction would not have an effect on school enrollment or use of parks or other facilities as construction activities would be temporary and served by workers from the local labor pool (i.e., no growth inducement would occur).

Following construction, the Project would not result in population growth that would result in increased demand for schools, parks or other public facilities, or result in increased uses of existing facilities, which could accelerate the deterioration of those facilities. No impact would occur.

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
XVI. Recreation				
Would the Project:				
a. Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				✓
b. Include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?				✓

Discussion:

XVI. a) Increase in the Use of Existing Facilities – No Impact

Construction would not have an effect on the use of parks or other recreational facilities as construction activities would be temporary and served by workers from the local labor pool (i.e., no growth inducement would occur). Following construction, the Project would not result in population growth that could result in increased use of recreational facilities, therefore, no physical deterioration would occur.

XVI. b) Development of Recreation Facilities Resulting in Substantial Physical Deterioration – No Impact

There are no parks or park facilities planned for development as part of the Project. Therefore, no impact would occur from construction or expansion of new recreational facilities.

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
XVII. Transportation				
Would the Project:				
a. Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?			✓	
b. Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?				✓
c. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				✓
d. Result in inadequate emergency access?			✓	

Discussion:

XVII. a) Conflict with a Program Plan, Ordinance or Policy Addressing the Circulation System, including Transit, Roadway, Bicycle and Pedestrian Facilities – Less than Significant

During construction, the existing bridge crossing would be closed to vehicles for approximately eight months. As described in Section XI, Land Use and Planning, access to State Route 162 and to the Town of Covelo from residences located adjacent to the Project area on the east side of the bridge would be available by travelling north along Hill Road for 3.25 miles, then west on East Lane for another 3.25 miles. Residences located in the Project area on the west side of the bridge would be able to continue to use their normal route to State Route 162 (for example, Hill Road to Dobie Lane to Fairbanks Lane). Therefore, the impact of the temporarily closed bridge would have a less than significant impact on the overall performance of the circulation system.

Following construction, the Project would not consist of new development that would result in an increase in traffic. The roadway widening is not intended to increase the vehicle capacity of Hill Road and any increase would be negligible given that no additional travel lanes are proposed. No impact would occur.

Potential impacts on public transit and alternative modes of transportation is analyzed in Impact XVI.f below.

XVII. b) Conflict or be Inconsistent with CEQA Guidelines Section 15064.3, subdivision (b) – No Impact

The proposed Project is a transportation project, as MDOT is currently proposing to replace a structurally deficient bridge. As stated in Impact XVII.b above, the Project would not consist of new development that would result in an increase in traffic. The roadway widening is not intended to increase the vehicle capacity of Hill Road and any increase would be negligible given that no additional travel lanes are proposed. Therefore, the Project would have no impact on vehicle miles traveled. CEQA Guidelines Section 15064.3(b)(1).) (2) states:

> Transportation projects that reduce, or have no impact on, vehicle miles traveled should be presumed to cause a less than significant transportation impact."

In accordance with CEQA Guidelines Section 15064.3, subdivision (b), the Project would cause a less than significant transportation impact. As such, the Project would not conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b), and would result in no impact.

XVII. c Substantially Increase Hazards due to a Design Feature or Incompatible Use – No Impact

The Project would replace an existing structurally deficient bridge with a new bridge. Therefore, the Project would have a beneficial effect on transportation by eliminating risks from an existing structurally deficient structure.

As described in the Project Description, the horizontal alignment of the new bridge would match that of the existing bridge, which is approximately perpendicular to the normal stream alignment of Mill Creek. The new bridge would allow for two way travel, as opposed to the existing single-lane travel afforded by the existing bridge. The bridge would not introduce design features that would increase hazards, such as sharp curves. No impact would occur.

XVII. d) Result in Inadequate Emergency Access – Less than Significant

During construction, the existing bridge crossing would be closed to vehicles, including emergency vehicles, for approximately eight months. As described in the Project Description, emergency responders would be notified in advance of closure dates. In addition, Hill Road on either side of the bridge would remain open during construction and could be accessed by emergency responders using alternative routes. The Project site is essentially halfway along the “loop” formed by Hill Road in the area. The length of time to access the Project site for the west or the east would be similar. Therefore, the temporary closure of the bridge during construction would have a less than significant impact on emergency access.

Following construction, the widened bridge and roadway approaches would improve the ease of emergency access across the bridge when compared to existing conditions. No long-term impact would occur.

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
XVIII. Tribal Cultural Resources				
Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
a. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or		✓		
b. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.		✓		

The CEQA Guidelines define tribal cultural resources as: (1) a site, feature, place, cultural landscape, sacred place, or object with cultural value to a California Native American Tribe that is listed or eligible for listing on the California Register of Historical Resources, or on a local register of historical resources as defined in Public Resources Code Section 5020.1(k); or (2) a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant according to the historical register criteria in Public Resources Code Section 5024.1(c), and considering the significance of the resource to a California Native American tribe.

XVIII. a, b) Cause a substantial adverse change in the significance of a tribal cultural resource – Less Than Significant with Mitigation

As described in Section 3.V, Cultural Resources, an Archaeological Resources Study was prepared for the Project (GANDA 2013b). The study included: a records and literature search at the Northwest Information Center (NWIC) of the California Historical Resources Information System (CHRIS); communication with the Native American Heritage Commission (NAHC) to request a review of the Sacred Lands File; additional contact with appropriate local Native American tribes; and a pedestrian archaeological survey of the Project area. As a result of consultation undertaken in 2012, the Wailaki, the Round Valley Indian Tribe, Round Valley Indian Tribe of Covelo, California, and Yuki responded. The Wailaki, Round Valley Indian Tribe, and Yuki expressed concern over the removal of the bridge, as it is of historic value. The Round Valley Indian Tribes of Covelo indicated that the Project is located in an area that is sensitive for prehistoric tribal resources and requested that a tribal monitor be present during ground disturbance.

Additionally, in February 2020, a second round of consultation letters were sent out under Section 106 to reinitiate consultation due to the delay of the Project. On April 16, 2020, the Round Valley Indian Tribe

responded and requested additional information. GHD provided the additional information and on May 28, 2020. The Round Valley Indian Tribe followed-up with a response requesting a Native-American monitor be on-site during ground disturbing activities and to be included in future meetings related to the Project. To date, no other responses have been received.

The Archaeological Resources Study found that based on the records search and field survey, no historic properties have been identified within the Project site. One historic period resource does exist within the Project site, the Mill Creek Bridge. However, the Mill Creek Bridge is listed in Caltrans' Historic Bridge Inventory as ineligible for listed in the National Register for Historic Places and does not have cultural value to Native American Tribes. Although no eligible historic properties have been identified within the Project Area, the potential exists to encounter as-of-yet unknown historic or archaeological materials during project-related construction activities. If such resources were to represent "tribal cultural resources" as defined by CEQA, any substantial change to or destruction of these resources would be a potentially significant impact; therefore, the following mitigation is included.

Mitigation Measure TCR-1: Minimize Impacts to Tribal Cultural Resources

If potential tribal cultural resources are uncovered, the County shall halt work, and workers shall avoid altering the materials and their context. Project personnel shall not collect cultural materials. MDOT shall notify California Native American tribes culturally affiliated with the Project area. MDOT, in coordination with Native American tribes, shall determine if the resource qualifies as a tribal cultural resource under CEQA. If it does, then all work must remain stopped in the immediate vicinity to allow evaluation of any materials. MDOTshall ensure that qualified resources are avoided or protected in place, in accordance with the requests of Native American tribes, to the extent feasible. Work may proceed on other parts of the project while mitigation for tribal cultural resources is being carried out.

Mitigation Measure TCR-2: Tribal Monitor

MDOT shall provide the Round Valley Indian Tribe the opportunity to send a tribal monitor to the Project site during all ground disturbing activities associated with the proposed Project. Monitoring will consist of directly watching the excavation, grading, trenching, and other earth-moving processes. Monitoring will occur during the entire workday, and continue on a daily basis until all ground disturbing activities have ceased.

Implementation of Mitigation Measure TCR-1 and TCR-2 would reduce this impact to a less-than-significant level because a plan to address discovery of unanticipated buried tribal cultural resources and to preserve and/or record those resources consistent with appropriate laws and requirements would be implemented, and a tribal monitor would be present during ground disturbing activities.

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
XIX. Utilities and Service Systems				
Would the Project:				
a. Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?				✓
b. Have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry and multiple dry years?				✓
c. Result in a determination by the wastewater treatment provider which serves or may serve the Project that it has adequate capacity to serve the Project's projected demand in addition to the provider's existing commitments?				✓
d. Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?			✓	
e. Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?			✓	

Discussion:

XIX. a) Require Relocation, Construction or Expansion of New Water, Wastewater Treatment, Stormwater Drainage, Electric Power, Natural Gas, or Telecommunications Facilities– No Impact

Neither construction nor operation of the Project would require new, expanded, or relocated water, wastewater treatment, storm water drainage, or dry utilities. During the construction phase the Project would require a limited amount of water for dust suppression, which would be trucked in as needed. No long-term use of water would be required during operation of the Project. Additionally, the Project would not result in short-term or long-term generation of wastewater requiring treatment and no storm drain facilities or expansion of existing storm drain facilities would be required. Storm water runoff in the Project area currently sheet flows off the side of the roadway approaches and the bridge platform and would continue to do so under the proposed Project. No other dry utilities would be required to serve the Project during construction or operation. Therefore, the relocation, construction, or expansion of wet or dry utility facilities would not be required. No impact would occur

XIX b, c) Sufficient Water Supply and Wastewater Capacity-No Impact

The Project would require minimal water for dust suppression during the construction phase of the Project. No water would be required for the long-term operation of the Project. Therefore, existing water supply should be sufficient to temporarily serve the Project. No new regional water supplies or facilities would be reburied. Therefore, implementation of the Project would not impact water supply during normal, dry and multiple dry years. No impact would result.

The Project would not generate any wastewater requiring treatment during construction or operation of the Project. Therefore, no wastewater capacity would be demanded from the local wastewater treatment facility. No impact would occur.

XIX. d) Have Sufficient Landfill Capacity Related to Solid Waste – Less than Significant

Construction would result in a temporary increase in solid waste generation, including concrete, paving, and soil associated bridge demolition and roadway widening. As described in the Project Description, demolition waste would be stockpiled and sorted outside the creek channel and then loaded for disposal or recycling at appropriate off-site facilities. The old truss super-structure would remain County property and would be hauled to a County Corporation Yard located in Ukiah.

Demolition materials with no practical reuse or that could not be salvaged or recycled would be disposed of at a landfill. There are currently no operating landfills located within Mendocino County, and solid waste generated in the County is exported for disposal to landfills in Marin, Alameda, Contra Costa, and Solano counties, all located to the south. The landfills that the County uses would have sufficient capacity to accommodate the Project's short-term solid waste disposal needs. The impact would be less than significant.

Following construction, no solid waste disposal needs would be required for the Project. Therefore, no long-term impact would occur.

XIX. e) Comply with Statutes Related to Solid Waste – Less than Significant

Chapter 18.35 of the Mendocino County Code requires that debris and solid waste from demolition and construction be diverted from going to landfills through recycling, reuse, and diversion programs. Chapter 18.35 provides for compliance with the California Waste Management Act which requires the County to prepare, adopt, and implement source reduction and recycling elements to divert 50 percent of all solid waste from disposal within its jurisdiction.

Waste generated during construction would be required to be disposed of in accordance with standard County operating procedures pursuant to federal, State and local regulations. As described above, the old truss super-structure would be retained by the County and demolition waste would be sorted and loaded for disposal or recycling at appropriate off-site facilities, with only demolition materials that have no practical reuse or that could not be salvaged or recycled being disposed of at a landfill. The short-term impact would, therefore, be less than significant.

Following construction, no solid waste disposal needs would be required for the Project. Therefore, no long-term impact would occur.

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
XX. Wildfire				
If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a. Substantially impair an adopted emergency response plan or emergency evacuation plan?			✓	
b. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?				✓
c. Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?				✓
d. Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?			✓	

Discussion:

The Project site is partially located within a state responsibility area designated as having a moderate wildfire risk (CalFire 2019). Therefore, this Initial Study includes an evaluation of the State CEQA Guidelines Appendix G questions related to wildfire.

XX. a) Substantially impair an adopted emergency response plan or emergency evacuation plan – No Impact

The County of Mendocino's 2016 Emergency Operations Plan includes and identifies emergency planning, organization, policies, procedures, and response to extraordinary emergency situations associated with natural disasters, technological incidents, and national security emergencies (Mendocino County 2016).

During construction, the existing bridge crossing would be closed to vehicles, including emergency vehicles, for approximately eight months. As described in the Project Description, emergency responders would be notified in advance of closure dates. In addition, Hill Road on either side of the bridge would remain open during construction and could be accessed by emergency responders using alternative routes. The Project site is essentially halfway along the "loop" formed by Hill Road in the area. From the Covelo Fire Protection District to the east side of Hill Road Bridge, responders would have to travel approximately 7.3 miles via Commercial Street, East Lane, and Hill Road. In comparison, to access the west side of the Hill Road Bridge, the responders would have to travel approximately 6 miles utilizing Commercial Street, Fairbanks Lane, Dobie Lane, and Hill Road, The length of time to access the Project site for the west or the east would be similar during construction as under existing conditions. Therefore, the temporary closure of the bridge during construction would have a less than significant impact on emergency access.

Following construction, the widened bridge and roadway approaches would improve the ease of emergency access across the bridge when compared to existing conditions. The Project would not impair implementation of an adopted emergency response plan. There is no separate emergency evacuation plan for the County, and the Project would not change existing circulation patterns or affect emergency response routes. Project development plans would be required to be reviewed by a Department of Fire and Emergency Services Fire Inspector during the building permit process to ensure adequate emergency access is provided to the site.

XX. b) Expose Project Occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire – No Impact

Wildfire risk is dependent upon existing environmental conditions, including but not limited to the amount of vegetation present, topography, and climate. The Project site is located within a rural area surrounded by oak woodland and riparian vegetation. Climate in the area is generally warm and temperate, with the winters being rainier than the summers.

The Project would replace a structurally deficient bridge and install rock slope protection along the creek banks. The proposed Project would serve as a multi-modal connection to the surrounding vicinity and would allow for movement away from a wildfire and associated pollutants should one occur in the vicinity. The Project would not house residents or other ‘occupants, nor would it promote users to linger within the Project footprint. Therefore, the project would result in no impact.

XX. c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment – No Impact

The proposed Project would replace the existing Mill Creek Bridge. No new infrastructure would be installed that would require additional maintenance beyond what is currently utilized. Once the bridge is installed there is not anticipated to be any temporary or ongoing impacts to the environment above the existing conditions. Therefore, no impact would occur.

XIX. g) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes– Less than Significant with Mitigation Incorporated

The proposed replacement bridge would be raised above the 100-year flood plain and rip rap would be placed around the abutments to protect against erosion. Additionally, following construction, drainage patterns would be substantially the same as existing conditions. The RSP to be placed on the channel banks would not interfere with normal channel flows. The Project would result in only negligible increases in impervious surfaces from the widened roadway approaches. Therefore, the Project would not result in localized increases in the rate or amount of surface runoff that would result in flooding downslope or downstream.

The Project site is located within an area where the natural creek banks slope at about 2:1 (H:V) or slightly steeper. The site-specific geotechnical study identified a 12-foot thick potentially liquefiable soil zone extending from the west bank into the channel. The potential impact from landslides or slope instability is considered significant, and could potentially be exacerbated under post- fire conditions. However, with implementation of Mitigation Measure GEO-1, the geologic instability of the bridge and immediate surrounding would be reduced to a less than significant level.

Mitigation Measure GEO-1: Implement Geotechnical Recommendations

See discussion of VII.a.ii above for a description of this mitigation measure.

4. Mandatory Findings of Significance

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
Would the Project:				
a. Does the Project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?		✓		
b. Does the Project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a Project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?			✓	
c. Does the Project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?		✓		

Discussion:

4. a, c) Less than Significant with Mitigation

With implementation of the mitigation measures presented herein, the Project does not have the potential to degrade the quality of the environment, including fish or wildlife species or their habitat, plant or animal communities, important examples of the major periods of California history or prehistory, or adverse effects on human beings.

4. b) Less than Significant

Cumulative impacts are defined as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts" (CEQA Guidelines Section 15355). Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time. This IS/Proposed MND utilizes the "plan" approach, per CEQA Guidelines Section 15130(d), to determine if the Project makes a considerable contribution to a significant cumulative impact.

As discussed in Section XI., *Land Use and Planning*, the Project would not conflict any applicable land use plans, policies, or regulations which govern the Project area. The Project's impact would not add appreciably to any existing or foreseeable future significant cumulative impact, such as visual quality, traffic

impacts, or noise. Incremental impacts, if any, would be negligible and undetectable. As reported throughout this analysis, any applicable cumulative impacts to which this Project would contribute would be mitigated to a less-than-significant level.

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Appendix A

Natural Environment Study



Natural Environment Study

Hill Road Bridge at Mill Creek, Mendocino County
Bridge No. 10C0111
01-MEN-236-C.R. 327B-PM 2.05

Federal Aid Project Number: BRLO5910(084)
FWS File Number: 08EACT00-2018-E-00042
February 2020

Caltrans
CALIFORNIA DEPARTMENT OF TRANSPORTATION

Natural Environment Study

STATE OF CALIFORNIA
Department of Transportation
Mendocino County

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Summary

The Mendocino County Department of Transportation is proposing to replace a single lane bridge on Hill Road which crosses over Mill Creek in Mendocino County. The existing Hill Road Bridge is a single lane, single-span, through-truss bridge with steel trusses and a wood deck, 36.6 m (120 ft.) long by 5.5 m (18 ft.) wide (hereafter Project). It was categorized as "Structurally Deficient" by the California Department of Transportation (Caltrans) in 2012.

The Project area is located in rural Mendocino County, California in the North Coast Range. It crosses over Mill Creek, which is a tributary to the Middle Fork Eel River (Appendix A; Figures 1-3). The proposed Project will replace the existing single lane bridge with a new two lane bridge and widened roadway approaches to eliminate risks from the structural deficiency and improve overall access (Appendix B; Photo 1-2, 7-8). The new bridge will be approximately 44.2 m (145 ft.) long and 7.9 m (26 ft.) wide; 7.6 m (25 ft.) longer and 2.4 m (8 ft.) wider than the existing bridge. The new bridge will be located in the same footprint as the existing bridge; therefore, the approaches to the bridge will remain in the same place. New bridge footings will be placed to the outside (away from the creek bed) of the existing footings and Mill Creek channel will be widened approximately 6.1 m (20 ft.) on the west bank and 3 m (10 ft.) on the east bank to allow for the longer bridge structure. Approximately 61 m (200 ft.) long sections of the roadway at either end of the bridge will be widened from one lane to two lane width.

This Natural Environment Study (NES) provides biological information necessary for subsequent environmental determinations under the California Environmental Quality Act and the National Environmental Policy Act. Its focus is on the identification of biological resources, assessment of potential project impacts, and the identification of avoidance and minimization measures within the biological study area (BSA) (Figure 4). A Biological Assessment was written in accordance with U.S. Fish and Wildlife Service (USFWS) guidelines for federally listed species with a potential to occur in the project area (Species lists in Appendix C; BA in Appendix G).

The total construction disturbance area is estimated to be 0.36 hectares (0.9 acre) (Figures 3 and 5). The permanent impacts from this Project are anticipated to be limited to the areas of expansion on the roadway approaches, additional shading of the creek bed, the area where the creek channel is widened and new abutments will be placed, and the slightly widened bridge footprint. The direct, though temporary, impacts are anticipated to be limited to the areas used for construction access into the creek channel, and the area under the bridge and immediately surrounding it. Indirect impacts would be construction noise and vibration in the immediate vicinity (Appendix D; Figure 6).

A survey of Mill Creek was performed at the Project area to delineate the Ordinary High Water Mark (OHWM) and lateral extent of the ephemeral/intermittent channel in accordance with the United States Army Corps of Engineers (ACOE) 2008 guidelines (Appendix E; Figures 5, 7, 13). Mill Creek typically has little to no flow during the summer months. The delineation mapped 0.46 acres to be jurisdictional waters of the US. No wetlands were observed within or adjacent to the Project site. Since the proposed Project will not result in permanent impacts on wetlands, a Wetlands Only Practicable Alternative Finding pursuant to Executive Order 11990, Protection of Wetlands (1977) is not required for the Project.

The area surrounding the Project includes rural residential property, agricultural land use in nearby Covelo, and protected forest lands (Figure 8). Three special status plants and eleven special status animals have potential to be present in the Project area (Appendix C; Figure 10).

Aquatic and riparian habitats associated with Mill Creek and the Eel River (Figure 5) will be protected by limiting the project footprint to the smallest area possible, avoiding construction during the rainy season when water is flowing in Mill Creek, through implementation of standard construction best management practices and post-construction habitat restoration. The proposed Project design avoids the placement of piers in the creek channel and the re-routing of roadway approaches. Through the implementation of project avoidance and minimization measures, including the observation of construction windows, the proposed Project is not likely to impact most special status species. The proposed Project may adversely affect Steelhead, if any are present in remnant pools and must be relocated. A worker environmental awareness training, pre-construction surveys, and construction monitoring will be conducted to minimize the risk of impacts to potentially occurring special status species.

Permits expected for this project include a Clean Water Act (CWA) Section 404 Nationwide Permit from ACOE; a CWA 401 Water Quality Certification from the State Regional Water Quality Control Board (RWQCB); a General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities Order No. 2010-0014-DWQ issued by the North Coast RWQCB; and a California Department of Fish and Wildlife Section 1602 Lake and Streambed Alteration Agreement. Formal consultation with the National Marine Fisheries Service and/or USFWS may be required. Other regulations that apply include the Federal Migratory Bird Treaty Act and the California Endangered Species Act.

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Acronym List

ACOE	Army Corps of Engineers
BMP	best management practices
BSA	Biological Study Area
Caltrans	California Department of Transportation
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFGC	California Fish and Game Code
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
C.R.	county road
CWA	Clean Water Act
CWHR	California Wildlife Habitat Relationships
dbh	diameter at breast height
DOT	U.S. Department of Transportation
EFH	Essential Fish Habitat
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
GANDA	Garcia and Associates
IPaC	Information for Planning and Consultation
MBTA	Migratory Bird Treaty Act
McDOT	Mendocino County Department of Transportation
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NEPA	National Environmental Policy Act
NES	Natural Environment Study
NMFS	National Marine Fisheries Service
NPDES	National Pollution Discharge Elimination System
NPPA	Native Plant Protection Act
NRCS	Natural Resources Conservation Service
OHWM	Ordinary High Water Mark
PM	post mile
RSP	rock slope protection
RWQCB	Regional Water Quality Control Board
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey

Chapter 1 – Introduction

Hill Road is the primary east-west route in the Project vicinity and serves as an important linkage to and from southern Covelo and the southeastern region of Round Valley. The existing bridge has been determined by the California Department of Transportation (Caltrans) to be structurally deficient. The proposed Project would replace the existing single lane bridge with a new two lane bridge and widened roadway approaches.

Project History

The existing bridge has been determined by Caltrans to be structurally deficient. Mendocino County Department of Transportation (McDOT) has been consulting with Caltrans/ Federal Highway Administration (FHWA) since 2008. No other agency consultation has taken place to date.

Documents Preparation by Garcia and Associates (GANDA) began in late 2012, with review of versions during 2013, 2014, and 2015. GHD biologists compiled a final draft version in February 2019.

Project Description

Hill Road Bridge, number 10C0111, on Hill Road crosses over Mill Creek in northeastern unincorporated Mendocino County. Hill Road is designated a rural connector, county road (C.R.) 327B. The bridge is located approximately 2.4 km (1.5 mi) east of the intersection of Hill Road and Dobie Lane, at post mile (PM) 2.05 (Figures 1 and 2). The Project area is located within the Jamison Ridge 7.5-minute United States Geological Survey (USGS) quadrangle, township 22N, range 12W, section 22, latitude 39.7491N, longitude -123.1814W.

The proposed Project would replace the existing single lane bridge with a new two lane bridge and widened roadway approaches. The new bridge would be approximately 44.2 m (145 ft.) long and 7.9 m (26 ft.) wide, which would be 7.6 m (25 ft.) longer and 2.4 m (8 ft.) wider than the existing bridge. The horizontal alignment of the new bridge would match that of the existing bridge, which is approximately perpendicular to the normal stream alignment of Mill Creek. The new bridge would be similar in character to the existing bridge, namely a single-span, steel truss structure (Appendix B- Photo 1-2, 7-8). All of the considered alternatives would require pile driving to install some form of pile supported foundations. In addition to the new bridge, approximately 61 m (200 ft.) sections of the roadway on either side of the bridge would be improved with two 2.7 m (9 ft.) wide travel lanes with 0.6 m (2 ft.) wide shoulders to accommodate the new bridge deck elevation, width and location. Staging would occur along the roadway on either side of the creek (Figure 3).

Four Project alternatives were considered to replace the single lane bridge with a two lane bridge. Alternative Four is the preferred alternative and has been selected for analysis.

ALTERNATIVE ONE – THREE-SPAN CAST-IN-PLACE CONCRETE SLAB BRIDGE

This alternative would include cast-in-place sections that would span approximately 14.7 m (48.3 ft.) and be supported by two-center pier and bent caps in the middle of the

creek. The elevation view of the bridge would appear to be a concrete two-span bridge with piers at 1/3 spacing within the creek, and the ends of bridge would bear on cast-in-place concrete abutments. A concrete barrier parallel to the road surface would also be constructed. Temporary construction support would be required for the piers and along the length of the bridge to support the formwork of the concrete slab.

This alternative would provide a thin bridge deck, minimizing the extents of the conform grades; however, it would also require two pile supported pier walls in the channel, increasing the environmental impact, permitting process, creek scour, and in-creek construction requirements.

ALTERNATIVE TWO – TWO-SPAN PRECAST CONCRETE GIRDER BRIDGE

This alternative consists of precast members that would span approximately 22.1 m (72.5 ft.), and be supported by a center pier and bent cap in the middle of the creek. A single-span option is not presented since precast concrete members much longer than 24.4 m (80 ft.) cannot feasibly be shipped to the job site. The elevation view of the bridge would have a similar appearance as Alternative 1, but would instead include a single concrete pier and bent cap in the middle of the channel with the ends of bearing on cast-in-place concrete abutments. Temporary construction work would be required in the middle of the creek to install the center pier and concrete bent cap. No other temporary supports would be required within the waterway.

This alternative would provide a quick construction period by offering a precast solution. However, it would also require a pile supported pier wall in the channel, increasing the environmental impact, permitting process, creek scour, and in-creek construction requirements.

ALTERNATIVE THREE – SINGLE-SPAN CAST-IN-PLACE CONCRETE GIRDER BRIDGE

This alternative would consist of a large concrete slab that sits on four equally spaced embedded I-beams. The elevation view of the bridge would appear to be a concrete single-span bridge, with a concrete barrier parallel to the road surface. The ends of the bridge would sit on cast-in-place concrete abutments. Temporary supports would be required inside the waterway during construction to hold the concrete forms in place.

This alternative provides less environmental impacts by offering a single span solution. However, it would also require a thick bridge deck, which would create a change in grade from the low elevation of Hill Road.

ALTERNATIVE FOUR – SINGLE-SPAN WEATHERING STEEL TRUSS BRIDGE (PREFERRED)

This alternative would provide a steel truss bridge made of weathering steel, a special alloy that is designed to form an exterior rust barrier, providing a low-maintenance surface that does not require cleaning or painting. This bridge would be prefabricated in modular sections, transported to the site, assembled onsite, and lifted into place using mobile cranes. The elevation view of the bridge would closely match the general shape of the existing bridge, a steel truss with a straight bottom chord, and a bowed upper chord. The ends of bridge would be supported on cast-in-place concrete abutments supported by piles. No temporary supports would be required within the waterway.

This alternative would provide less environmental impacts by offering a single span solution, while keeping the bridge deck fairly thin and maintaining the low elevation of Hill Road to avoid sudden vertical changes where the bridge and road meet.

TIMEFRAME AND APPROACH

Construction is anticipated to take place during the 2024 construction season, roughly April through October. Various pre-construction surveys and avoidance measures may be conducted/implemented prior to the planned construction season, such as installation of bat roosting avoidance. Construction activities within the banks of Mill Creek would be performed between July 15 and October 15, when there is little or no stream flow, unless negotiated otherwise with the jurisdictional agencies during the Project's resource permitting process. Construction activities outside of the creek banks such as road widening and tree trimming may take place before and after these dates. During the time the existing bridge is dismantled and the new bridge constructed, the existing bridge crossing would be closed to vehicles and detours would route traffic around the crossing. Traffic would be routed around the Project site utilizing alternate roadways in the area. No temporary crossing is proposed.

If water is present in the channel between June and October, the flow will be diverted by either placing sandbags, installing two sets of k-rails and a rubber lining, installing super sacks, or installing sheetpiles along the construction area to allow low flow to continue through the construction area. Depending on the amount of flow present the contractor shall implement one of the above-listed diversion tactics. If flow is shallow, sand bags can be placed along the construction area. If there is a greater amount of flow present either the k-rail, super sack, or sheetpile option could be implemented. If there is no flow during the construction period (typical of late summer/early fall most years), diversion may be unnecessary or optional.

Under implementation of the k-rail diversion technique, the channel bottom would need to be excavated so the rubber lining lies flat along the bottom of the channel. Then two rows of k-rails will be installed parallel to the creek banks to hold the lining in place and keep the flow away from the construction activities. Under implementation of the super sacks, some excavation would also need to occur to place a plastic lining, and then two large sacks filled with rock would be positioned along each creek bank. For both the k-rail and super sack dewatering options some gravel would be placed on the lining to provide habitat for amphibians as well as passage for fish species. Under implementation of the sheetpile diversion method, temporary sheetpiles will be advanced or pushed into the sediments using non-vibratory methods along both creek banks.

If flow is present and dewatering is required, block nets would first be placed at each end and qualified biologists would capture and relocate any native fish or other native aquatic species present in the reach to be dewatered. Once dewatering is implemented and flow is diverted away from the construction area, a biologist would be present and any standing water would be observed for fish. All fish located within the construction area immediately prior to or during dewatering will be captured by seine, dip net, and/or electrofisher and removed by qualified biologists pre-approved by NMFS. The fish will be placed in an aerated cooler or 5-gallon bucket of water from the habitat they were captured in and then be relocated within 30 minutes of capture to suitable habitat within the action area, but outside the immediate project footprint. Fish relocation will occur

during the work window and is only anticipated to occur for one construction season, only if flow or remnant pools are present, and be conducted by qualified fisheries biologists. A relocation plan would be prepared and submitted to NMFS for approval at least two weeks prior to the start of construction.

If a remnant pool is present in the work area with no flow and no connection to other standing water, methods would be as immediately above except with no diversion. Biologists would stand by during dewatering to relocate native aquatic organisms.

If it is determined during final design that a diversion method would result in additional impacts not fully analyzed in this NES (piledriving which extends noise/vibration impacts, grading of the channel which could result in adverse effects to ESA-listed species) then that method would not be utilized.

Construction equipment, including cranes, excavators, jack hammers, and shovels, would be used to remove the existing bridge deck, truss, concrete abutments, headwalls, and associated footings from the creek. Existing concrete abutments are located outside of the creek channel and would be cut below grade and left in place. Demolition waste would be stockpiled and sorted outside the creek channel. Suitable foundation alternatives for the new abutments are determined to include steel H-piles, Cast-in-Drilled-Hole piles and Cast-in-Steel-Shell piles. New abutments will be placed to the outside of existing abutments away from the creek channel (Appendix D). No work within the wetted portion channel is proposed.

A temporary access road would be constructed along the gravel bar along the eastern side of the wetted portion of the channel to accommodate limited as-needed construction activities, such as the installation of scour protection for the abutments. Piles at each new bridge support would be placed below the scour line of the streambed of Mill Creek to a depth of up to 24.4 m (80 ft.). A crane would be used to set a new prefabricated steel structure in place.

As part of the proposed Project, the existing bridge abutments would be removed and the bank re-contoured to match the existing bank slopes, or to a maximum 2:1 slope. The abutments supporting the new bridge would be installed behind the existing abutments and further up the channel bank. This would effectively widen the opening at the bridge by approximately 6.1 m (20 ft.) on the west bank and 3.1 m (10 ft.) on the east bank. After obtaining the engineered grade of the channel banks, rock slope protection (RSP) would be placed to armor and protect the channel banks from potential erosion. There would be a permanent placement of approximately 343.7 m^2 (3,700 ft^2) of RSP: approximately 288 m^2 (3,100 ft^2) on the west bank and 241.5 m^2 (2,600 ft^2) on the east bank. Once the new bridge and RSP is complete, exposed and disturbed areas of the creek bank and construction area would be seeded and mulched. Native plants including locally sourced willow cuttings would be used for re-vegetation.

The total construction disturbance area is estimated to be 0.36 hectares (0.9 acre). The permanent impacts from this project are anticipated to be limited to the areas of expansion on the roadway approaches, the area where the creek channel is widened and new abutments would be placed, and the slightly widened bridge footprint. The temporary impacts are anticipated to be limited to the areas used for construction access into the creek channel, and the area under the bridge and immediately surrounding it (Figures 3 and 5)

Chapter 2 – Study Methods

The study methods in this NES were employed to ensure compliance with all Federal and state regulations. A desktop literature and database review and a reconnaissance level survey of the biological study area (BSA) (Figure 4). The reconnaissance level field survey was conducted on August 30, 2012 by GANDA biologists, Sumudu Welaratna, M.S., and Sarah Willbrand, M.S. In 2017, the literature search and desktop review were updated by GHD biologists to reflect the most recent changes to special status species and habitats. Information was reviewed again in April 2019 by GHD biologists. A reconnaissance level site visit was conducted on May 8, 2019 by GHD Senior Biologist Ken Mierzwa to update habitat information and assess conditions for special-status species.

Regulatory Requirements

Permits expected for this project include a Clean Water Act (CWA) Section 404 Nationwide Permit with U.S. Army Corps of Engineers (ACOE); a CWA 401 Water Quality Certification from Regional Water Quality Control Board (RWQCB); and a Section 1602 Lake and Streambed Alteration Agreement from California Department of Fish and Wildlife (CDFW). Formal consultation with National Marine Fisheries (NMFS) may be necessary for project impacts to federally listed species. Other regulations that apply include the federal Migratory Bird Treaty Act (MBTA) and the California Endangered Species Act (CESA). A discussion of all of the above laws, and other federal and state laws and policies which may apply is presented below.

FEDERAL LAWS

Federal Endangered Species Act of 1973 (FESA), as Amended (Public Law 93-295)

With the passage of FESA, the U.S. Congress pledged the Nation to conserve, to the extent practicable, species of wildlife and plants facing extinction, pursuant to international treaties, conventions, and agreements; and to encourage states, through Federal financial assistance and a system of incentives, to adopt practices which safeguard the Nation's heritage of biological resources. Federal agencies that fund, authorize, or carry out actions that "may affect" a listed species and its habitat, must consult with the USFWS and/or NMFS according to the provision in Section 7(a) of FESA for federal actions. The USFWS has jurisdiction over plants, wildlife, and resident fish; NMFS has jurisdiction over anadromous fish, marine fish, and marine mammals. Provisions of the 1982 amendments to FESA authorize USFWS and NMFS to permit the taking of listed species, if such taking is "incidental to, and not the purpose of carrying out otherwise lawful activities [16 U.S.C. 1539 and Section 10(a)(1)(B) of FESA] pursuant to Section 7 of FESA for federal actions."

Magnuson-Stevens Fishery Conservation and Management Act (MSA)

Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires federal agencies to consult with NMFS on activities that may adversely affect Essential Fish Habitat (EFH) for federally managed fish species. These species include commercial fishes with established Fisheries Management Plans as managed by regional fisheries management councils.

EFH includes those waters and substrate necessary for fish spawning, breeding, feeding, or growth to maturity. In the definition of EFH: "waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means the habitat required to support a sustainable fishery and the managed species contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle.

Section 401 of the Clean Water Act (CWA)

Section 401 of the CWA requires that an applicant for a Federal license or permit that allows activities resulting in discharge to waters of the United States must obtain a state certification that the discharge complies with other provisions of CWA. The RWQCB administers the certification program and issues National Pollution Discharge Elimination System (NPDES) permits.

Migratory Bird Treaty Act (MBTA)

The MBTA of 1918 provides protection for "migratory birds… or any part, nest, or egg of any such bird" (16USC 703). Under this Act, the following activities are prohibited: "pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner." For the purpose of this Project, any Project activity that disturbs an active nest or causes nest abandonment are prohibited. Structures (such as netting or plastic sheeting) may be used to discourage the construction of nests by birds at the Project area.

National Environmental Policy Act (NEPA) (42 U.S.C. 4321 et. Seq.)

The NEPA of 1969 established policy and procedures to bring environmental considerations into the planning process for Federal projects. NEPA requires all Federal agencies to identify and assess reasonable alternatives to proposed actions that will restore and enhance the quality of the human environment and avoid or minimize adverse environmental impacts. Implementing regulations by the Council on Environmental Quality (40 CFR Parts 1500-1508) direct Federal agencies to emphasize significant environmental issues to project planning and to integrate impact studies required by other environmental review laws and executive orders into the NEPA process. The NEPA process should, therefore, be seen as an overall framework of the environmental evaluation of Federal actions.

Fish and Wildlife Coordination Act (16 U.S.C. 661-666)

Project proponents are required under the provisions of this Act to coordinate with USFWS and CDFW with regard to projects that affect the waters of streams or other water bodies, and wildlife resources (including plants) and their habitats.

Section 404 of the Clean Water Act (CWA) (33 U.S.C. 1251-1376)

The discharge of dredged or fill material into "waters of the United States" is regulated by the ACOE under Section 404 of the CWA. "Waters of the United States" are broadly defined in 33 CFR 328.3 (a) (ACOE Regulatory Program Regulations, Federal Register Vol. 51, No. 219, November 13, 1986) to include non-tidal, perennial, and intermittent watercourses, and tributaries to such watercourses, with no stated limit on the order of tributary included as "waters."

The lateral limits of ACOE jurisdiction for non-tidal watercourses (without adjacent wetland areas) are defined in 33 CFR 329.11 (a)(1) as the "ordinary high water mark" (OHWM). OHWM is defined as "...the line on the (watercourse banks) established by the fluctuations of water and indicated by physical characteristics such as a 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". ACOE definition of a wetland is, "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions". The edges of perennial and seasonal-flow watercourses often display these characteristics as an aquatic/wetland interface, or "wetland fringe". This situation will dictate extending the lateral limit of ACOE jurisdiction beyond the OHWM to include the wetland fringe (see 33 CFR 328.3(a)).

Executive Order 11990 – Protection of Wetlands

Executive Order 11990 established a national policy to avoid adverse impacts on wetlands whenever there is a practicable alternative. The U.S. Department of Transportation (DOT) promulgated DOT Order 5660.1A in 1978 to comply with this direction. On federally funded projects, impacts on wetlands must be identified. Alternatives that avoid wetlands must be considered. If wetland impacts cannot be avoided, then all practicable measures to minimize harm must be included.

Executive Order 13112 – Invasive Species

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

Under the Executive Order, federal agencies cannot authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless all reasonable measures to minimize risk of harm have been analyzed and considered.

STATE LAWS

California Environmental Quality Act (CEQA)

(P.R.C. 21000 et seq.). The basic purposes of CEQA are to: inform governmental decision makers and the public about the potential significant environmental effects of proposed activities; identify ways that environmental damage can be avoided or significantly reduced; prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds changes to be feasible; and, disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved. An Initial Study is being prepared to assess the Project's environmental impacts as required under CEQA. It is currently anticipated that the Project would require an Initial Study/Mitigated Negative Declaration.

California Endangered Species Act (CESA)

(Sections 2050-2098 California Fish and Game Code). The basic policy of CESA is to conserve and enhance endangered species and their habitats. As such, state agencies cannot approve any action under their jurisdiction when the action will result in the extinction of endangered and threatened species or destroy habitat essential to their continued existence, if reasonable and prudent alternatives exist (Section 2053). However, CESA allows approval of projects resulting in jeopardy if there are overriding social and economic factors. CESA requires that the lead agency conduct an endangered species consultation with CDFW if the proposed action could affect a state-listed species. This process is similar to a Federal Section 7 consultation with NMFS and USFWS and requires providing CDFW with information on the project and its potential impacts. CDFW then prepares a written finding on whether the proposed action will jeopardize the listed species or destroy essential habitat. In the case of an affirmative finding, CDFW presents alternatives to avoid jeopardy. Implementation of CDFW recommendations become mandatory components of the project.

Native Plant Protection Act (NPPA)

The NPPA of 1973 (Sections 1900-1913 California Fish and Game Code). The legal protection afforded listed plants under the act includes provisions that prohibit the taking of plants from the wild and a salvage requirement for landowners. If a landowner has been informed of the presence of a listed species on the property, CDFW must be notified at least ten days in advance of any land use change that might affect the species or its habitat, thereby affording CDFW an opportunity to conduct a salvage operation. Candidate species are also protected from taking under NPPA.

Section 1602 of the California Fish and Game Code (CFGC)

CDFW has authority under Sections 1601 and 1607 of the CFGC to issue an agreement with attached conditions (a "Streambed Alteration Agreement") authorizing certain actions that will "...divert, obstruct or change the natural flow or bed, channel or bank of any river, stream or lake designated by CDFW in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit…"

Studies Required

In 2012, GANDA biologists conducted a desktop literature and database review and a reconnaissance level survey of the BSA. GHD updated the literature review multiple times, most recently in late 2019. A list was generated of the species that are listed as endangered, threatened, or proposed for listing as endangered or threatened under the ESA, and of designated critical habitat that may occur in BSA (Table 1) from the following sources (database searches provided in Appendix C):

- Query for records within the nine-quad area centered on the Jamison Ridge, CA USGS 7.5-minute quadrangles from the California Department of Fish and Wildlife's California Natural Diversity (CNDDB) Database, Rarefind, on November 13, 2019 (CDFW 2019).
- Query for records within the nine-quad area centered on the Jamison Ridge, CA USGS 7.5-minute quadrangles from the California Native Plant Society's Database on November 13, 2019 (CNPS 2019).
- Query for records within the nine-quad area centered on the Jamison Ridge, CA USGS 7.5-minute quadrangles from IPaC Trust resource reports, November 13, 2019 (USFWS 2019).
- Query for records within the nine-quad area centered on the Eureka, CA USGS 7.5-minute quadrangles from NOAA Fisheries West Coast Region California Species List Tools, November 13, 2019 (NOAA Fisheries 2019).

Desktop scoping also included reviewing the National Wetland Inventory Maps (USFWS 2017), the Natural Resources Conservation Service (NRCS) Web Soil Survey (NRCS 2017); and current aerial imagery. I

This research and survey were conducted in order to:

- Characterize the vegetation and wildlife habitat types, including common flora and fauna, and potential wetland resources;

- Evaluate the potential for occurrence of federal and state-listed species and other classes of special status species that are known to have the potential to occur in areas adjacent to the Project;

- Evaluate the potential permanent and temporary, direct and indirect impacts of the Project to the above resources.

Biologists conducted a reconnaissance-level field visit to determine the likelihood of sensitive resources to occur within, or adjacent to, the BSA. This survey included walking the entire BSA to document plant communities and habitat types. The survey was focused on determining whether the BSA contained suitable habitat to support special status species and whether jurisdictional waters and wetlands were present. In addition, a delineation of Mill Creek within the BSA was performed in accordance with the procedures outlined in the ACOE Field Guide to the Identification of the OHWM in the Arid West Region of the Western United States Delineation Manual (Lichvar and McColley, 2008; Figure 5; Appendix E). A Biological Assessment was also written in accordance with USFWS guidelines for federally listed species with a potential to occur in the BSA (Revised 2019 version attached in Appendix G).

Personnel and Survey Dates

The reconnaissance-level field survey was conducted on August 30, 2012 by GANDA biologists Sumudu Welaratna, M.S., and Sarah Willbrand, M.S. A new reconnaissance level site visit was conducted on May 8, 2019 by GHD Senior Biologist Ken Mierzwa to update habitat information and assess conditions for special-status species. Caltrans biologists also conducted a field visit in August 2019.

Agency Coordination and Professional Contacts

McDOT has been consulting with Caltrans/FHWA regarding the proposed action since 2008. An official species list was received from the USFWS on October 19, 2017. A species list was received from NMFS on January 19, 2018 and update via a database search on November 13, 2019. The USFWS list was updated through an IPaC query on March 8, 2019 and November 13, 2019. No other coordination with agencies has taken place to date.

Preparation of the NES began by GANDA in late 2012 with review of ongoing versions during 2013, 2014, and 2015. GHD biologists completed this final draft version in February 2020.

Limitations That May Influence Results

The reconnaissance level site survey was conducted in August 2012 to record vegetation communities within the BSA and assess habitat for the potential to support sensitive species. Mill Creek had no stream flow within the BSA during the field survey. The survey was also conducted outside of the blooming period for some special status plants. Protocol surveys for plants or wildlife have not been conducted. An inferred presence approach based on available habitat is being used for species determinations.

The updated reconnaissance level site visit on May 8, 2019 was conducted when continuous slow flow was present in Mill Creek. The late spring survey date allowed an assessment of available habitat conditions at a time of year when more wildlife species are likely to be active.

Chapter 3 – Results: Environmental Setting

The BSA is located in rural Mendocino County in the North Coast range of California as shown in Appendix A, Figure 1. Appendix A, Figure 2 shows the topographic location. There are residential buildings and outbuildings within the BSA both upstream and downstream from the Hill Road Bridge. The area surrounding the BSA also includes rural residential property and some agricultural uses in nearby Covelo. To the east of the Project area there is a substantial area of contiguous protected lands from the Shasta Trinity National Forest and Six Rivers National Forest and Yolla Bolly-Middle Eel Wilderness to the northeast and the Mendocino National Forest to the west and southwest (Figure 8).

Description of the Existing Biological and Physical Conditions

STUDY AREA

A BSA was determined for the Project (Appendix A, Figure 4). As shown in Figures 3 and 5, the Project impact area is expected to be limited to the footprint of the existing Hill Road Bridge, which crosses over Mill Creek, and approximately 61 m (200 ft.) along Hill Road in both directions. In addition, a small existing graveled driveway will be used to provide temporary construction access to the creek bed. The BSA used for the survey includes the Project area and approx. 350 m (1,148 ft.) north and south from the bridge along Mill Creek. There are residential buildings and outbuildings within the BSA both upstream and downstream from the Hill Road Bridge. The area surrounding the BSA also includes rural residential property and some agricultural uses in nearby Covelo. To the east of the Project area there is a substantial area of contiguous protected lands from the Shasta Trinity National Forest and Six Rivers National Forest and Yolla Bolly-Middle Eel Wilderness to the northeast and the Mendocino National Forest to the west and southwest.

PHYSICAL CONDITIONS

The Project is located approximately 396 m (1,300 ft.) above sea level in an area with gentle slopes. The soils in the BSA are comprised mainly of Xerochrepts-Haploxeralfs-Argixerolls complex (71%) and Xerofluvents (27.6%), both of which are derived from alluvial material. Moving upstream, a small area of Pinole gravelly loam (1.4%) is also included in the BSA (NRCS 2017; Figure 9; Appendix F).

Mill Creek is a tributary to the Middle Fork Eel River. The creek flows southeasterly, entering the Middle Fork Eel River about 33.47 stream km (20.8 stream mi) upstream from the Eel River confluence (Becker and Reining 2009). The Eel River flows into the Pacific Ocean just south of Humboldt Bay in northern California (Appendix A, Figure 1). There are no dams blocking fish passage between the mouth of the Eel River and the project. Water is diverted into the Russian River upstream from the confluence of the Middle Fork Eel River with the mainstem Eel River. This diversion is part of the Potter Valley Project which began in 1906 to divert water into the Russian River to supply water to the more populous area to the south. Although this does not directly affect the BSA, it results in decreased flows in the Eel River and increased flows in the Russian River. The Potter Valley Project has, in part, contributed to reduced anadromous fish runs in the Eel River and its tributaries (NMFS 2012).

Mill Creek within the BSA is typically dry during the summer months. United States Geological Survey (USGS) stream gage No. 11473700 is located just downstream of the BSA and acquired data from 1956 to 1971. The watershed and gage was part of the USGS investigation "Magnitude and Frequency of Floods in California" (Waananen and Crippen 1977), so although the location has not received a detailed study from the Federal Emergency Management Agency (FEMA) for flood insurance purposes, the watershed and flow has received significant study and analysis by USGS. USGS gage data shows little or no flow during August, September, and October during the period from 1956 to 1971. The field visits confirmed no flow in August 2012 and continuous slow flow with wide but relatively shallow water and partially exposed gravel bars in May 2019.

BIOLOGICAL CONDITIONS IN THE BIOLOGICAL STUDY AREA

Two vegetation communities, *Quercus douglasii* Woodland Alliance and *Salix gooddingii* Woodland Alliance, were noted by GANDA within the BSA in 2012. GHD updated the vegetation types based on desktop review of recent literature in 2017. The updated vegetation communities are described below. The classification of vegetation in the project limits is based on A Manual of California Vegetation 2nd Edition (Sawyer et al. 2009), which describes all major vegetation types known in California. The natural vegetation types, called “alliances”, are floristically defined by their dominant and/or characteristic species. In addition to the alliances discussed below, the BSA includes Mill Creek as well as paved and graveled roadways.

QUERCUS DOUGLASII WOODLAND ALLIANCE – BLUE OAK WOODLAND

The Quercus *douglasii* Woodland alliance establishes in varied stands and forms one of the most extensive and conspicuous vegetation types in California. It is found in valley bottoms, foothills, and rocky outcrops, in areas where soils are shallow and low in fertility. Dominated or co-dominated by blue oaks, the canopy ranges from intermittent to continuous with a sparse to intermittent shrub layer. Herbaceous layer is sparse or grassy and forbs are present seasonally (Sawyer et al. 2009).

Blue oak woodland is present along the perimeter of the Project limits and the border of the BSA situated furthest from Mill Creek.

QUERCUS LOBATA WOODLAND ALLIANCE – VALLEY OAK WOODLAND

The *Quercus lobata* Woodland Alliance is found in riparian corridors and valley bottoms in intermittently saturated soils. These communities are characterized by valley oaks dominating more than a third of the canopy cover often co-occurring with willows and other riparian species. Valley oaks are deciduous, have deeply lobed leaves and grow to just under 114 ft. tall. Round Valley actually hosts the tallest known living valley oak in the U.S. California Wildlife Habitat Relationships (CWHR) estimates more than 30 bird species and 80 mammal species utilize valley oak woodlands, many include acorns in their diets (CWHR 2017; MCV2017; CTNR 2017).

Valley oak woodland is the dominant oak woodland throughout the BSA situated beyond the riparian corridor associated with the creek and along Hill Road.

SALIX LASIOLEPIS SHRUBLAND ALLIANCE – ARROYO WILLOW THICKETS

Arroyo willow thickets occur throughout the state along intermittent and permanent stream edges and drainages in the Northern CA Coast Ranges. This habitat is adapted to withstand, but is often modified by, winter flooding. These willows can reach to more than 30 ft. tall and form an open to continuous canopy over a variable herbaceous layer (MCV2017). CWHR classifies it under its Fresh emergent wetland habitat. This is considered among some of the most productive habitats for wildlife in California (CWHR 2017).

Arroyo willow thickets form a patchy riparian corridor along Mill Creek within the BSA.

AQUATIC FEATURES

Mill Creek is a tributary to the Middle Fork Eel River, which then connects to the Eel River that flows into the Pacific Ocean just south of Humboldt Bay in northern California. Mill Creek in the BSA typically is reduced to isolated pools with little or no flow during the summer months and is classified as an intermittent stream within the USGS National Hydrology Dataset.

Regional Species and Habitats and Natural Communities of Concern

Special status species are plant and wildlife species that are legally protected under the FESA, CESA, or other state regulations, and species that are considered sufficiently rare by the scientific community to warrant conservation concern. The special status species identified through the desktop literature and database review and their habitat requirements are identified in Appendix C (9-quad search). Some of these species are not expected to be present in the BSA due to lack of suitable habitat, as described in the table, and are not discussed further in the NES. A discussion of sensitive species and sensitive natural communities with moderate to high potential for occurrence within the BSA is provided in Chapter 4.

Table 1: Listed, Proposed, and Sensitive Wildlife and Plant Species with Potential to Occur within or in the Vicinity of the BSA.

Common Name	Scientific Name	Status (Federal/state/ Other special status)	General Habitat Description	Habitat Present/ Absent	Occurrence Potential
WILDLIFE					
Amphibians and Reptiles					
Foothill Yellow-legged Frog	*Rana boylii*	--/STC/SSC	Rocky streams and rivers with rocky substrate and open, sunny banks, in forests, chaparral, and woodlands.	**HP**	**High.** Suitable habitat for Foothill yellow-legged frog is present within the BSA. CNDDB/BIOS occurrence records are present on Middle Fork Eel River. The nearest CNDDB record is 4.8 km (3 mi) from the BSA and dated 1913. The most recent CNDDB record in the project vicinity is 7.8 km (4.85 mi) from the BSA and dated 1991. A Caltrans field team also observed two Foothill Yellow-legged Frogs roughly 30 meters downstream of the Project area in August of 2019.
California Red-legged Frog	*Rana draytonii*	FT/--/SSC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development. Must have access to estivation habitat.	**HA**	**None.** There are no known occurrences near the BSA and the Project area falls outside the species' range (Shaffer et al. 2004).
Western Pond Turtle	*Emys marmorata*	--/--/SSC	Ponds, rivers, and other permanent and semi-permanent water	**HP**	**High.** Suitable habitat is present within Mill Creek, and one adult was observed during the May 2019 site visit.

Common Name	Scientific Name	Status (Federal/state/ Other special status)	General Habitat Description	Habitat Present/ Absent	Occurrence Potential
Northern Red-legged Frog	*Rana aurora*	--/--/SSC	Humid forests, woodlands, grasslands, and streamsides in northwestern California, usually near dense riparian cover. Generally near permanent water, but can be found far from water, in damp woods and meadows, during non-breeding season.	**HP**	**Low.** There are no known occurrence records of this species from the project vicinity (CDFW 2019, iNaturalist 2019). In addition, no Northern Red-legged Frogs were observed during the site visit in 2019. The BSA is located at the interior extent of the species range, and thus this species has a low likelihood to occur (Thomson et al. 2016).
Birds					
Western Yellow-Billed Cuckoo	*Coccyzus americanus occidentalis*	FT/SE/--	Nests in riparian areas with dense willow thickets and cottonwoods, loosely territorial with a home range ranging from 4 to 40 hectares. Insectivorous, forages in foliage.	**HP**	**Low.** As discussed in the BA, the BSA lacks extensive dense riparian habitat preferred by this species for nesting. The nearest CNDDB/BIOS occurrence records for Western Yellow-billed Cuckoos are about 87 km (54.1 mi) south from the BSA near Clear Lake and 97 km (60.3 mi) east from the BSA along the Sacramento River.
Northern Spotted Owl	*Strix occidentalis caurina*	FT/ST/ SSC	Older forested habitat with moderate to high canopy closure. Nests in cavities or on platforms in large trees and will use abandoned nests of other species.	**A**	**Low.** As discussed in the BA, the BSA lacks large, old growth forest preferred by this species for nesting. However, northern spotted owl may disperse through the BSA due to the presence of potential habitat located in the montane conifer forests surrounding Round Valley. The nearest CNDDB/BIOS occurrence record for this species is about 12.1 km (7.5 mi) southwest of the BSA and dated 1997.

Common Name	Scientific Name	Status (Federal/state/ Other special status)	General Habitat Description	Habitat Present/ Absent	Occurrence Potential
Marbled Murrelet	*Brachyramphus marmoratus*	FT/SE/--	Feeds near-shore; nests inland along coast from Eureka to Oregon border and from Half Moon Bay to Santa Cruz. Nests in old-growth redwood-dominated forests, up to six miles inland, often in Douglas-fir.	**A**	**Low.** The BSA does not contain old growth coniferous forest or redwood habitats preferred by the Marbled Murrelet for nesting. The nearest CNDDB/BIOS occurrence record for this species is about 39 km (24.2 mi) west of the Project area and dated 1995 (CDFW 2019).
Western Snowy Plover	*Charadrius nivosus*	FT/--/SSC	Sandy beaches, salt pond levees & shores of large alkali lakes. Needs sandy, gravelly or friable soils for nesting.	**A**	**None.** The BSA does not include suitable beach/foredune habitats typically preferred by this species for nesting. Additionally, the nearest CNDDB/BIOS occurrence record for Western Snowy Plover is about 59 km (36.7 mi) southwest of the Project area and dated 1978 (CDFW 2019).
Mammals					
Pallid Bat	*Antrozous pallidus*	--/--/SSC	Roosts include crevices in rocky outcrops and cliffs, caves, mines, trees and various human structures such as bridges, bat boxes, and buildings. Forage over open shrub-steppe grasslands, oak savannah grasslands, open Ponderosa pine forests, talus slopes, gravel roads, lava flows, fruit orchards, and vineyards.	**HP**	**High.** The riparian corridor with man-made structures, including the existing Hill Road Bridge and nearby rural residences and outbuildings provide suitable roosting and foraging habitat for the pallid bat. The nearest CNDDB/BIOS occurrence record is 6.4 km (4 mi) from the BSA and dated 1998. Pallid bat was likely observed during the Caltrans 2019 field review.
Townsend's Big-eared bat	*Corynorhinus townsendii*	--/--/SSC	Caves and buildings in the vicinity of Douglas fir woodlands	**HP**	**Low.** The BSA does not include Douglas fir woodlands; however, the BSA contains suitable foraging habitat and possible suitable roosting habitat with coniferous forests surrounding Round Valley. The nearest CNDDB/BIOS record is 6.4 km (4 mi) from the BSA and dated 1998.

Common Name	Scientific Name	Status (Federal/state/ Other special status)	General Habitat Description	Habitat Present/ Absent	Occurrence Potential
Western Red Bat	*Lasiurus blossevillii*	--/--/SSC	Roost in dense tree foliage & orchards; feed along forest edges, in small clearings, or around street lights. Closely associated with cottonwoods in riparian areas at elevations below 1,981 m (6,500 ft.).	**HP**	**High.** The riparian corridor within the BSA provides possible roosting and suitable foraging habitat for this species. The nearest CNDDB/BIOS occurrence record is 6.4 km (4 mi) from the BSA and dated 1998.
Hoary Bat	*Lasiurus cinereus*	CDFW Special Animals List/WBWG M	Broadleaved upland forest, cismontane woodland, lower montane coniferous forest, or North Coast coniferous forest. Prefers open habitats or habitat mosaics, with access to trees for cover and open areas or habitat edges for feeding. Roosts in dense foliage of medium to large trees. Feeds primarily on moths. Requires water.	**HP**	**High.** The riparian corridor and woodlands within the BSA provide suitable roosting and foraging habitat for this species The nearest CNDDB/BIOS occurrence record is 6.4 km (4 mi) from the BSA and dated 1998.
Long-eared Myotis	*Myotis evotis*	CDFW Special Animals List/WBWG M	Found in all brush, woodland and forest habitats from sea level to about 9,000 ft. Prefers coniferous woodlands and forests. Nursery colonies in buildings, crevices, spaces under bark, and snags. Caves used primarily as night roosts.	**HP**	**Medium.** The BSA does not contain coniferous forests; but, the riparian corridor, woodlands, and existing bridge could provide suitable roosting and foraging habitat for the Long-eared Myotis. The nearest CNDDB/BIOS occurrence record is 6.4 km (4 mi) from the BSA and dated 1998.
Fisher – West Coast DPS	*Pekania pennanti*	FC/--/--	Mature conifer forest with snags and down woody debris	**A**	**Low.** Although possibly present in surrounding montane conifer forests, the open oak and riparian woodlands in the BSA do not provide suitable habitat for this species. This species is not likely to occur in the BSA.

Common Name	Scientific Name	Status (Federal/state/ Other special status)	General Habitat Description	Habitat Present/ Absent	Occurrence Potential
Humboldt Marten	*Martes caurina humboldtensis*	--/SE/--	Occurs only in the coastal redwood zone from the Oregon border south to Sonoma County. Associated with late-successional coniferous forests, prefer forests with low, overhead cover.	**A**	**None.** No suitable habitat exists within the BSA. There are no recent records of this species south of the Klamath River. Current populations are only known from coastal redwood forests in Del Norte and northern Humboldt County (CDFW 2019). CNDDB records from the area are considered historical (1915 and 1917) and likely not representative of extant populations.
American Badger	*Taxidea taxus*	--/--/SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Needs sufficient food, friable soils and open, uncultivated ground. Preys on burrows rodents. Digs burrows.	**A**	**Low.** No suitable habitat exists within the BSA although suitable habitat may occur in the vicinity (ranches/open prairie land). There are no recent records of the species from the project vicinity (CNDDB 2019).
North American Porcupine	*Erethizon dorsatum*	CDFW Special Animals List	Wide variety of coniferous and mixed woodland habitats. Broad-leaved upland forest, cismontane woodlands, closed-cone, North Coast, upper montane or lower montane coniferous forest; forested habitats in the Sierra Nevada, Cascade, and Coast ranges, with scattered observations from forested areas in the Transverse Ranges.	**HP**	**Medium.** The BSA contains woodland habitat suitable for presence of North American porcupine, but the existing road(s) may fragment the habitat for this species. The nearest CNDDB/BIOS occurrence record is 7.9 km (4.9 mi) from the BSA and dated 1961.
INVERTEBRATES					

Common Name	Scientific Name	Status (Federal/state/ Other special status)	General Habitat Description	Habitat Present/ Absent	Occurrence Potential
Obscure Bumble Bee	*Bombus caliginosus*	--/---/CDFW Special Animals List	Coastal areas from Santa Barbara county north to Washington state. Food plant genera include *Baccaris*, *Cirsium*, *Lupinus*, *Lotus*, *Grindelia*, and *Phacelia*.		**Medium.** Project site falls within the species current range and there were records of the species from the vicinity in 1972 (Hatfield et al. 2014, CDFW 2019). In addition, the project vicinity may contain several of the species' food plants.
FISH					
Steelhead northern California DPS	*Oncorhynchus mykiss irideus*	FT/--/SCE (summer-run)	Anadromous, Spawns in streams and river basins along the northern CA coast from Redwood Creek in Humboldt County to the Gualala River. Includes winter and summer steelhead. Adults need access to natal streams; eggs and fry need cool water with adequate dissolved oxygen; clean gravel; juveniles migrate to the ocean.	**CH**	**High.** Presence of juveniles documented above and below project site by CDFW in 1996. The creek is a tributary of the Middle Fork Eel River, which supports spawning steelhead. The proposed project would temporarily impact Mill Creek during no or very low flows during the summer outside of the timing for and fall/winter steelhead spawning. No permanent impacts or barriers to the creek are proposed. If juvenile steelhead are present in remnant pools relocation may be necessary.
Chinook Salmon California coastal ESU	*Oncorhynchus tshawytscha*	FT/--/--	Anadromous; coastal rivers; streams and creeks from Klamath River to the Russian River basin. Adults spawn in natal streams; eggs and fry need cool water with adequate dissolved oxygen; clean gravel; juveniles migrate out to the ocean. Information on smaller populations is extremely limited.	**CH**	**Low.** No recent records from Mill Creek. The creek is a tributary of the Middle Fork Eel River, which supports Chinook. The proposed project would temporarily impact Mill Creek during no or very low flows during the summer outside of the timing for spring and fall/winter salmon spawning. No permanent impacts or barriers to the creek are proposed.

Common Name	Scientific Name	Status (Federal/state/ Other special status)	General Habitat Description	Habitat Present/ Absent	Occurrence Potential
Coho Salmon southern Oregon /northern California ESU	*Oncorhynchus kisutch*	FT/ST/--	Federal listing refers to populations between Cape Blanco, Oregon and Punta Gorda, Humboldt County, California. State listing refers to populations between the Oregon border and Punta Gorda, California.	**CH**	**Low.** Although present in the Eel River, Coho Salmon are believed to have been extirpated from the Middle Fork drainage (Brown and Moyle 1991, Yoshiyama and Moyle 2010). In terms of FESA Critical Habitat, all accessible estuarine areas, rivers, and tributaries between the Mattole River in California and the Elk River in Oregon are included in this designation. This designation encompasses the Middle Fork Eel River and Mill Creek in Covelo (64 FR 24049).
Tidewater Goby	*Eucyclogobius newberryi*	FE/--/--	Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith River. Found in shallow lagoons and lower stream reaches, they need fairly still but not stagnant water and high oxygen levels.	**A**	**None.** No habitat for this species is present within the BSA.
PLANTS					
Rattan's milk-vetch	*Astragalus rattanii* var. *rattanii*	--/--/4.3	Chaparral, cismontane woodland, lower montane coniferous forest. Gravelly streambanks (elevation 95 to 2,705 ft.). Blooming period: Apr-Jul	**HP**	**Medium.** The BSA contains gravelly streambanks and collections of this species have been made in the project vicinity; however, this species has not been identified to date within the BSA. The nearest occurrence record is 3.37 km (2.1 mi) from the BSA and dated 1980 (CCH 2017).

Common Name	Scientific Name	Status (Federal/state/ Other special status)	General Habitat Description	Habitat Present/ Absent	Occurrence Potential
Milo Baker's lupine	*Lupinus milo-bakeri*	--/ST/1B.1	Cismontane woodland (often along roadsides) and valley and foothill grassland. In roadside ditches, dry gravelly areas along roads, and along small streams. Known from fewer than twenty occurrences (elevation 1,295 to 1,410 ft.). Blooming period: Jun-Sep	**HP**	**Medium.** Cismontane woodland and roadside habitat typically associated with this species is present within the BSA. Milo Baker's lupine is endemic to California and known from nine occurrences in the Round Valley. It is also known from a transplanted location near Longvale and an occurrence in Colusa County although identification of the Colusa County population is questionable. This species is thought to be endemic to Round Valley. This species was not noted in the BSA during the site survey in August 2012, however this is an annual species and the seed bank is presumed to be long lived. The nearest CNDDB/BIOS occurrence record is 5.7 km (3.5 mi) from the BSA and last observed in 1986. Recent monitoring by CDFW and Caltrans has documented the species only to the west near Covelo.
white-flowered rein orchid	*Piperia candida*	--/--/1B.2	Broadleaved upland forest; lower montane coniferous forest; North Coast coniferous forest. Sometimes on serpentine. Forest duff, mossy banks, rock outcrops, and muskeg (elevation 95 to 4,300 ft.) Blooming period: (Mar) May-Sep	**HP**	**Medium.** The BSA contains forest duff, mossy banks, and rock outcrops that have the potential to support white-flowered rein orchid; however, the BSA does not include serpentine soils and this species was not recorded during the site survey. The nearest occurrence record for this orchid is in the East Covelo Quadrangle, but specific information has been redacted due to its sensitivity (CCH 2017).

Common Name	Scientific Name	Status (Federal/state/ Other special status)	General Habitat Description	Habitat Present/ Absent	Occurrence Potential
cylindrical trichodon	*Trichodon cylindricus*	--/--/2B.2	Broadleaved upland forest, meadows and seeps, upper montane coniferous forest, sandy, exposed soil, road banks (elevation 160 to 6,570 ft.). Blooming period: NA (Moss)	**A**	**Medium.** The BSA includes roadsides within woodland habitat that could support cylindrical trichodon; however, the BSA does not include upper montane coniferous forest, meadows, or seeps. The nearest CNDDB/BIOS occurrence record is located more than five miles from the BSA.
scabrid alpine tarplant	*Anisocarpus scabridus*	--/--/1B.3	Upper montane coniferous forest. Open stony ridges, metamorphic scree slopes of mountain peaks, and cliffs in or near red fir forest. 1550-2350 m. Blooming period: (Jun) Jul-Aug (Sep)	**A**	**None.** No habitat for this species is present within the BSA.
Konocti manzanita	*Arctostaphylos manzanita ssp. elegans*	--/--/1B.3	Chaparral, cismontane woodland, lower montane coniferous forest. Volcanic soils. 225-1830 m. Blooming period: (Jan) Mar-May (Jul)	**HP**	**Medium.** Habitat for this species is present within the BSA and the species may be present.
watershield	*Brasenia schreberi*	--/--/2B.3	Freshwater marshes and swamps. Aquatic known from water bodies both natural and artificial in California. 1-2180 m. Blooming period: Jun-Sep	**A**	**None.** No habitat for this species is present within the BSA.
three-fingered morning-glory	*Calystegia collina ssp. tridactylosa*	--/--/1B.2	Chaparral, cismontane woodland. Rocky, gravelly openings in serpentine. 605-705 m. Blooming period: Apr-Jun	**HP**	**Medium.** Habitat for this species is present within the BSA and the species may be present.

Common Name	Scientific Name	Status (Federal/state/ Other special status)	General Habitat Description	Habitat Present/ Absent	Occurrence Potential
Cascade downingia	*Downingia willamettensis*	--/--/2B.2	Cismontane woodland, valley and foothill grasslands, vernal pools. Lake margins. 15-1110 m. Blooming period: Jun-Jul (Sep)	**A**	**Low.** Habitat for this species is not present within the BSA but may be present in the project vicinity. Cismontane woodland is present, but no vernal pools or lake margin habitat is present.
glandular western flax	*Hesperolinon adenophyllum*	--/--/1B.2	Chaparral, cismontane woodland, valley and foothill grassland. Serpentine soils; generally found in sepentine chaparral. 425-1345 m. Blooming period: May-Aug	**HP**	**Low.** Cismontane woodland is present but serpentine soils are not present.
thin-lobed horkelia	*Horkelia tenuiloba*	--/--/1B.2	Broadleafed upland forest, chaparral, valley and foothill grassland. Sandy soils; mesic openings. 45-640 m. Blooming period: May-Jul (Aug)	**HP**	**Medium.** Habitat for this species is present within the BSA and the species may be present.
Baker's globe mallow	*Iliamna bakeri*	--/--/4.2	Chaparral, Great Basin scrub, pinyon and juniper woodland, lower montane coniferous forest. Often in burned areas. Volcanic substrates. 1000-2500 m. Blooming period: Jun-Sep	**A**	**None.** No habitat for this species is present within the BSA.

Common Name	Scientific Name	Status (Federal/state/ Other special status)	General Habitat Description	Habitat Present/ Absent	Occurrence Potential
Baker's meadowfoam	*Limnanthes bakeri*	--/--/1B.1	Marshes and swamps, valley and foothill grassland, meadows and seeps, vernal pools. Seasonally moist or saturated sites within grassland; also in swales, roadside ditches & margins of freshwater marshy areas. 175-915 m. Blooming period: Apr-May	**A**	**None.** No habitat for this species is present within the BSA.
marsh checkerbloom	*Sidalcea oregana ssp. hydrophila*	--/--/1B.2	Meadows and seeps, riparian forest. Wet soil of streambanks, meadows. 455-2030 m. Blooming period: (Jun) Jul-Aug	**HP**	**Medium.** Habitat for this species is present within the BSA and the species may be present.
Nuttall's ribbon-leaved pondweed	*Potamogeton epihydrus*	--/--/2B.2	Marshes and swamps. Shallow water, ponds, lakes, streams, irrigation ditches. 295-2640 m. Blooming period: (Jun) Jul-Sep	**HP**	**Medium.** Habitat for this species is present within the BSA and the species may be present.
Siskiyou fritillaria	*Fritillaria glauca*	--/--/4.2	Alpine boulder and rock field, Subalpine coniferous forest, Upper montane coniferous forest. Serpentinite, talus slopes 1735-2440 m. Blooming period: (Apr-May) Jun-Jul	**A**	**None.** No habitat for this species is present within the BSA.
Burke's goldfields	*Lasthenia burkei*	FE/SE/1B.1	Vernal pools, meadows and seeps. Most often in vernal pools and swales. 15-580 m. Blooming period: Apr-Jun	**A**	**None.** No habitat for this species is present within the BSA.

Common Name	Scientific Name	Status (Federal/state/ Other special status)	General Habitat Description	Habitat Present/ Absent	Occurrence Potential
Contra Costa goldfields	*Lasthenia conjugens*	FE/--/1B.1	Valley and foothill grassland, vernal pools, alkaline playas, cismontane woodland. Vernal pools, swales, low depressions, in open grassy areas. 1-450 m. Blooming period: Mar-Jun	**A**	**None.** No habitat for this species is present within the BSA.
two-fork clover	*Trifolium amoenum*	FE/--/1B.1	Valley and foothill grassland, coastal bluff scrub. Sometimes on serpentine soil, open sunny sites, swales. Most recently cited on roadside and eroding cliff face. 5-310 m. Blooming period: Apr-Jun	**A**	**None.** No habitat for this species is present within the BSA.
HABITATS					
Sensitive Communities					
Valley oak woodland	*Quercus lobata* Woodland	S3	Valley bottoms seasonally saturated soils that may be intermittently flooded, lower slopes, summit valleys. Soils are alluvial or residual (elevation 0-2,542 ft.).	**HP**	**High.** Valley oak woodland is present within the BSA.
Blue oak woodland	*Quercus douglasii* Woodland	S4	Dry, rocky, hilly terrain where the water table is usually unavailable	**HP**	**High.** Blue oak woodland is present within the BSA.
Upland Douglas Fir Forest	N/A	S3.1	North coast coniferous forest	**A**	**Low.** This sensitive community is not present within the BSA but may be present in the project vicinity.

Common Name	Scientific Name	Status (Federal/state/ Other special status)	General Habitat Description	Habitat Present/ Absent	Occurrence Potential
North Central Coast Summer Steelhead Stream	N/A	SNR	N/A	**HP**	**High.** Spring/summer run Steelhead occur in the Middle Fork of the Eel and tributaries, although numbers have declined significantly from historic levels (CDFG 1996, CDFG 1997, Yoshiyama and Moyle 2010).

Common Name/Habitat Description: Distinct Population Segment (DPS); Evolutionarily Significant Unit (ESU); feet (ft.); kilometers (km); miles (mi); not applicable (N/A)

Status Codes: No status to date (--); Federal Endangered (FE); Federal Threatened (FT); state Endangered (SE); state Threatened (ST); state Species of Special Concern (SSC); CDFW Special Animals List; Western Bat Working Group (WBWG) Medium Priority (M); California Rare Plant Rank (CRPR) Plants Rare, Threatened, or Endangered in California and Elsewhere seriously Threatened (1B.1), moderately threatened (1B.2), or not very threatened (1B.3) in California; CRPR Plants Rare, Threatened, or Endangered in California, but More Common Elsewhere are seriously threatened (2B.1), moderately threatened (2B.2), or not very threatened (2B.3); CRPR Plants of Limited Distribution, A Watch List; (4.1) seriously threatened in California, (4.2) moderately threatened in California, and (4.3) not very threatened in California ; Sensitive Natural Community Rank: (score ≤ 1.5) Critically Imperiled, (1.5 ≤ Score ≤ 2.5) Imperiled, (2.5 ≤ Score ≤ 3.5) Vulnerable, (3.5 ≤ Score ≤ 4.5) Apparently Secure, (Score > 4.5) Secure; Western Bat Working Group (WBWG) High Priority (H), Medium Priority (M), Low Priority (L)

Habitat Codes: Habitat Present - habitat is, or may be present, species may be present (HP); Habitat Absent – habitat is absent at the project site (A), and Critical Habitat - project footprint is located within a designated critical habitat unit, but does not necessarily mean that appropriate habitat is present (CH)

Occurrence Potential: Biological Assessment (BA); Biological Study Area (BSA); California Natural Diversity Database/Biogeographic Information and Observation System (CNDDB/BIOS)

Chapter 4 – Results: Biological Resources, Discussion of Impacts and Mitigation

Habitats and Natural Communities of Special Concern

"Special status natural communities are communities that are of limited distribution statewide or within a county or region and are often vulnerable to environmental effects of projects. These communities may or may not contain special status species or their habitat. The most current version of the CDFW's List of California Terrestrial Natural Communities indicates which natural communities are of special status given the current state of the California classification. Most types of wetlands and riparian communities are considered special status natural communities due to their limited distribution in California. These natural communities often also contain special status species…" (CDFG 2009)

In addition, oak woodlands are of economic and ecological value to the county and, therefore, are protected from fragmentation. As described in the Section 3, vegetation communities occurring in the BSA include blue oak woodland, valley oak woodland, arroyo willow thickets, and aquatic features. The approximate impacts from the Project to these habitat types are shown in Appendix A, Figure 5. Survey results, potential impacts and proposed avoidance and minimization measures are discussed below.

OAK WOODLAND ALLIANCES

Pursuant to the California Oak Woodlands Preservation Act, Senate Resolution No. 17, state agencies which have land use planning duties and responsibilities to assess and determine the effect of their decisions or actions within any oak woodland communities containing Blue, Englemann, Valley, or Coast Live oaks should preserve and protect native oak woodlands to the maximum extent feasible. Alternatively, they should provide replacement plantings commiserate with the effects of the discretionary actions they implement. Oak woodlands, including blue and valley oak, occur within the BSA along Hill Road and outside the riparian areas along Mill Creek. Oak woodlands are considered to be rare communities by the CDFW and important habitat for many species of wildlife. Valley oak woodland, which is prevalent within the BSA, has a State Rank of S3 and is considered imperiled in California due to a restricted range of occurrence. Blue oak woodland has a State Rank of S4.

Survey Results

Within the Project limits, valley oak woodland is found in the upland area surrounding the existing Hill Road Bridge to the north and south along Mill Creek. Other species identified during the site survey within this alliance include blue oak (*Quercus douglasii*), black oak (*Quercus kelloggii*), foothill pine (*Pinus sabiniana*), poison oak (*Toxicodendron diversilobum*) and Himalayan blackberry (*Rubus armeniacus*).

Project Impacts

Approximately 453 m^2 (0.1 acre) of valley oak woodland habitat will be affected by widening Hill Road on either side of the bridge and installation of the new abutments (Appendix A, Figure 5). This area is limited to a narrow strip along the alignment and may require nothing further than temporary impacts from removing understory

vegetation and trimming of overhanging branches to accommodate the increased width. If tree removal is required, it will be minimal. Seven oak trees (five with a tree trunk diameter greater than 12 inches and two with a diameter of 10 inches or smaller), one pine tree (14 inches in diameter), seven willow trees (four with a tree trunk diameter greater than 12 inches and three with a diameter of 10 inches or smaller), and six madrone trees (all smaller than 10 inches in diameter) may be removed (Figure 11, Table 2). If the impacts to oak trees are limited to brushing, this may be considered a temporary impact. No blue oak woodland would be impacted.

Table 2. Project Impacts to Tree Species from the Hill Road Bridge at Mill Creek Replacement Project

Tree type	# Trees with DBH >12	# Trees with DBH ≤ 10	Total # of trees to be removed
Oak	5	2	7
Pine	1	-	1
Willow	4	3	7
Madrone	-	6	6

Avoidance and Minimization Efforts

- The new bridge will be in the same location as the existing bridge and will, therefore, minimize tree removal to accommodate roadway approaches to the bridge.
- Construction activities related to disturbance of oak woodland shall be limited to the extent practicable.
- The Project footprint (i.e., disturbance area) would be minimized to the extent practicable for Project completion.
- Disturbed areas will be stabilized with rock slope protection (RSP) and re-vegetated with fast-growing native plants and biodegradable commercial hydraulic mulching materials as appropriate.

Compensatory Mitigation

If valley oaks greater than 10-inch diameter at breast height (dbh) are impacted, compensatory mitigation will likely be necessary. Mitigation would include replanting of oaks at ratios tied to dbh range and would occur in the BSA if practical. Disturbance of oaks would be limited to the minimum extent possible and revegetation activities are planned on-site.

Cumulative Impacts

No future projects are known to be planned within the BSA; a planned trail project along SR 162 in Covelo several miles to the northwest includes some oak removal which

would be fully mitigated by replanting. The proposed Project would also not contribute to fragmentation of oak woodland habitat, as the proposed Project would be implemented along existing features (i.e., bridge and road). Therefore, no cumulative impacts to valley oak woodland are anticipated from implementation of the proposed Project.

AQUATIC FEATURES

Mill Creek originates in predominantly forested mountains northwest of Round Valley. It flows out of the mountains through the level valley floor and is bordered by extensive agricultural lands and a narrow and fragmented riparian corridor. Mill Creek drains a watershed of approximately 105 square miles. Elevation at the mouth is 1,230 feet while headwaters areas are around 3,600 feet. Flows range from is approximately 0.3 cfs at the mouth to over 20 cfs during winter storms (CDFG 1996). The Middle Fork Eel River watershed spans Mendocino, Trinity, and Glenn counties and encompasses roughly 753 square miles.

Water temperature in the Middle Fork Eel and its tributaries is generally considered inadequate for summer rearing salmonids with the exception of the upper areas of certain tributaries. The EPA also considers the drainage to be sediment impaired (EPA 2003). Steelhead have been reported both upstream and downstream of the action project site in past surveys during late summer (1,857 and 35,376 feet above the mouth of Mill Creek; CDFG 1997). Mill Creek is designated critical habitat for Chinook Salmon (listed December 29, 1999), Steelhead (listed September 7, 2000; USFWS 2017a), and Coho Salmon (64 FR 24049).

Survey Results

A survey of Mill Creek was performed at the project location to delineate the OHWM and lateral extent of the ephemeral/intermittent channel in accordance with Army Corps of Engineers (ACOE) guidelines (Lichvar and McColley, 2008). The results are provided in Appendix A, Figure 5 and Appendix E.

Mill Creek in the BSA had no flow during the 2012 site visit. Ponded water was present in the creek channel on either side of the bridge. On-site observations of snags and debris in adjacent vegetation near a measuring panel attached to the existing Hill Road Bridge abutments indicate high water flow was approximately 4 m (13 ft.) above the creek bed. The creek bed had low vegetation cover (<10%). Survey of the creek bed found early successional herbs. These include mule fat *(Baccharis viminea)*, prostate pigweed (*Amaranthus blitoides*), turkey mullein (*Eremocarpus setigerus*), smoothstem shining star (*Mentzelia laevicaulis*), arroyo willow *(Salix lasiolepis)*, vinegar weed, (*Trichostema lanceolatum*), and cocklebur (*Xanthium strumarium*).

The survey also yielded an observation of Sacramento Pikeminnow (*Ptychocheilus grandis*) in the ponded water in the stream bed approximately 10 meters (32.8 feet) north of the bridge. The Sacramento Pikeminnow is native to the California Central Valley and was introduced into the Eel River around 1980 (Yoshiyama and Moyle 2010). They are a large piscivorous minnow, whose populations have thrived and are known to consume juvenile salmonids throughout the Eel River Basin (NMFS 2007).

During the May 2019 site visit, continuous mostly shallow water was present in Mill Creek and exceeded 50-feet in width in places. Flow was barely visible. One Western Pond Turtle (SSC) was observed basking on large woody debris adjacent to the bridge.

Two adult bullfrogs (an invasive species) and several very large tadpoles were observed in a deep pool just upstream of the bridge. Several schools of small fish were observed in open water in the center of the channel, and numerous small black tadpoles were present in shallows along the northwest bank at a considerable distance from the bridge. These could not be approached for identification because of intervening deep water and private lands, although season, size, and behavior would be consistent with tree frog or toad tadpoles.

Project Impacts

Approximately 580 m^2 (0.14 acre) of jurisdictional waters will experience temporary impacts due to access for this project, which will take place when the creek has no or low flows. Temporary impacts include an access road for construction equipment into the creek channel, removal of the existing concrete bridge abutments in the creek banks, and pile driving.

The Project is designed to avoid placing any permanent structures in the creek channel. However, the creek banks will be permanently affected by the removal of the existing bridge abutments and installation of the new bridge abutments. The creek banks would also be re-contoured and stabilized with RSP following installation of the new abutments.

Avoidance and Minimization Measures

- The single-span weathering steel truss bridge with no in-channel piers has been selected for the proposed project. This will reduce the need for work within the stream channel and leave no permanent structure in the channel.

- Work within the banks of Mill Creek shall be restricted to the period from July 15 to October 15 when the channel has little or no flow, unless negotiated otherwise with the jurisdictional agencies during the project's resource permitting process.

- If water is present in the creek during construction activities, the flow shall be diverted by either placing sandbags, installing two sets of k-rails and a rubber lining, installing super sacks, or installing sheetpiles along the construction area to allow low flow to continue through the construction area. Under implementation of the k-rail diversion technique, the channel bottom would need to be excavated so the rubber lining lies flat along the bottom of the channel. Then two rows of k-rails will be installed parallel to the creek banks to hold the lining in place and keep the flow away from the construction activities. Under implementation of the super sacks, some excavation would also need to occur to place a plastic lining, and then two large sacks filled with rock would be positioned along each creek bank. If flow is present and dewatering is required, block nets would first be placed at each end and qualified biologists would capture and relocate any native fish or other native aquatic species present in the reach to be dewatered. Once dewatering is implemented and flow is diverted away from the construction area, a biologist would be present and any standing water would be observed for fish. All fish located within the construction area immediately prior to or during dewatering will be captured by seine, dip net, and/or electrofisher and removed by qualified biologists pre-approved by NMFS.

- Construction equipment shall be cleaned and inspected prior to use. Servicing of vehicles shall be conducted a minimum of 30.5 m (100 ft.) from Mill Creek, at designated staging areas to avoid contamination through accidental drips and spills.

- The Project will comply with the Caltrans Construction Site Best Management Practices (BMP) Manual section NS-13: Material and Equipment Use Over Water.

- Any dewatering activities will follow the 2018 Caltrans Standard Specifications (http://www.dot.ca.gov/hq/esc/standards.phpDust, erosion, and sedimentation control will follow the 2010 Caltrans Standard Specifications (http://www.dot.ca.gov/hq/esc/standards.php).

- On-site stockpiles would be isolated with silt fence, filter fabric, and/or straw bales/fiber rolls. Silt fence and/or fiber rolls will be placed at bridge abutments, new abutment excavation areas, and any other locations when work could result in loose sediment that could enter the stream. The silt fence/fiber rolls will be maintained and kept in place for the duration of the project. Any sediment or debris captured by the fence/rolls will be removed before the fence/rolls are pulled. As necessary additional erosion, sediment, and material stockpile BMPs will be employed between work areas and adjacent waterway. No fill or runoff would be allowed to enter the waterway.

- The channel banks where the existing abutments are removed will be re-contoured and armored with RSP to protect against potential erosion. There would be a permanent placement of approximately 529.5 m^2 (5,700 ft^2) of RSP: approximately 288 m^2 (3,100 ft^2) on the west bank and 241.5 m^2 (2,600 ft^2) on the east bank. All RSP would be placed above the ordinary high water mark (Figure 13).

- Disturbed creek bank areas will be re-vegetated with fast-growing native plants, including locally sourced willow cuttings upon completion of work.

- The amount of construction-related disturbance in the aquatic feature shall be limited to the extent practicable. The project footprint should be minimized to the extent practicable.

Compensatory Mitigation

The proposed Project involves on-site revegetation of disturbed areas and willow plantings. Off-site improvements or other compensation is not required to offset Project impacts to critical habitat for fish, as there will be no net loss of the aquatic resource.

Cumulative Impacts

There are no known future projects/actions planned in the vicinity of Mill Creek within the BSA. A proposed trail along SR 162 north of Covelo includes a crossing of Mill Creek, however work within the creek is minimal, temporary, and limited to periods when the channel is dry and the location is several miles upstream of the BSA. Implementation of the avoidance and minimization measures would reduce the overall contribution to cumulative aquatic resource impacts resulting from completion of the Project. Therefore, no cumulative impacts to aquatic resources are anticipated from implementation of the proposed Project.

Special Status Wildlife Species

Animals are considered to be of special concern based on (1) Federal, state, or local laws regulating their status; (2) limited distributions; and/or (3) the habitat requirements of special status animals occurring on site. Three special status species were observed during field investigations within or adjacent to the BSA including: Western Pond Turtle, Foothill Yellow-legged Frog, and (likely) Pallid Bat.

Table 1 lists the special status animals that are known to occur or have moderate to high potential to occur in the project region. This list of species is based on the USFWS, CNPS, CNDDB, and NMFS documented occurrences. Only species with moderate to high potential to occur in the BSA are described below. Based on literature review, familiarity with fauna in the project region, and site survey results, a total of nine special status animal species are considered.

SPECIAL STATUS AMPHIBIANS AND REPTILES

FOOTHILL YELLOW-LEGGED FROG

The Foothill Yellow-legged Frog (*Rana boylii*) is designated a California species of special concern and was recently a candidate for listing under CESA although the north coast clade was ultimately not listed. This species is a moderately-sized amphibian, where adults are 3.8-8.1 cm (1.5 – 3.5 in) long from snout to vent. Typical coloration includes gray, brown, green, yellow and red tones. The underside of the rear legs and lower abdomen are often yellow or orangish-yellow (Californiaherps.com 2012). Breeding typically occurs during a two week period between April and early July. Females deposit eggs in clusters attached to gravel or rocks in moving water near stream margins, which hatch in about five to thirty-five days. Tadpoles reach maximum sizes of 50 to 55 mm (2.2 in) and require water for at least three or four months for development (Morey 2000; Californiaherps.com 2012). This species is rarely encountered far from permanent water (Morey 2000).

Foothill Yellow-legged Frogs occupy a variety of habitats, typically in or near rocky streams in valley-foothill hardwood-conifer, valley-foothill riparian, ponderosa pine, mixed conifer, coastal scrub, mixed chaparral, and wet meadows (Morey 2000; Californiaherps.com 2012). They prefer streams and rivers with rocky substrate and open, sunny banks, in forests, chaparral, and woodlands (Californiaherps.com 2012). The species is vulnerable to introduced predators including various fish and bullfrogs (Morey 2000).

Survey Results

No Foothill Yellow-legged Frogs were detected during the May site survey. That survey yielded the observation of small tadpoles, likely tree frogs or toads. At a nearby reference site on the same day, FYLF egg masses had not yet hatched so the observation is not believed to be of that species. American Bullfrog (*Lithobates catesbeiana*) adults and tadpoles were present in ponded water in the stream bed approximately 10 m (32.8 ft.) north of the bridge. Sacramento Pikeminnow (*Ptychocheilus grandis*) were previously reported in the BSA. Both bullfrogs and pikeminnows are potential predators for the Foothill Yellow-legged Frog (Morey 2000).

The BSA includes suitable habitat for the Foothill Yellow-legged Frog, including a rocky stream with some cobble-sized substrate, with areas of sunny banks and slow-flowing ponded water. The nearest CNDDB record is 4.8 km (3 mi) from the Project area in 1913. The most recent CNDDB record in the vicinity is 7.8 km (4.85 mi) from project area in 1991. (CNDDB 2019). However, a Caltrans field team observed two Foothill Yellow-legged Frogs roughly 30 meters downstream of the project area in August of 2019. Due to habitat quality, the close proximity of CNDDB records, and observations of Foothill Yellow-legged Frogs only 30 meters downstream of the Project area, it will be assumed that this species may be present during construction.

Project Impacts

Foothill Yellow-legged Frogs and tadpoles could be found if standing water is present during construction. Installation of a 0.91 m (3 ft.) diameter culvert placed in the channel at the upstream end of the project limits and de-watering activities, if necessary, would directly impact frogs if individuals are present in ponded water. Indirect impacts to Foothill Yellow-legged Frog would occur from general construction activities, such as increased human presence, noise, and dust within the BSA.

The Foothill Yellow-legged Frog was recently a CESA candidate but the north coast clade was not listed at the December 2019 FGC meeting; status reverts to SSC (Laura Patterson, CDFW, pers. comm., January 2020). North coast populations are relatively homogenous and more widespread than in other parts of the state. Avoidance measures consistent with SSC status such as relocation of frogs found in the construction footprint would still be required.

Avoidance and Minimization Efforts

- A qualified biologist shall be onsite to provide a worker environmental awareness training (tailboard) for crews at the commencement of construction. The training will include identification and life history of sensitive species (including Foothill Yellow-legged Frog), applicable regulations, species and habitat protection measures, fines and penalties, and procedures to be followed if sensitive species are observed on-site.

- Disturbance to the Foothill Yellow-legged Frog shall be avoided. A qualified biologist shall conduct a preconstruction survey along Mill Creek within and adjacent to the project area no more than one week before the start of construction and move any frogs within the construction area downstream and outside of the construction area. In addition, a qualified biologist will provide on-site monitoring for the duration of the installation of the culvert to divert water and any de-watering activities, if necessary. Any FYLF within the work area shall be relocated to the nearest suitable habitat.

- Exclusion fencing may also be installed, as appropriate, to prevent foothill yellow-legged frogs from entering the work area. If a pond containing tadpoles is located within 15.2 m (50 ft.) of construction activities, high visibility fencing will be installed around the pond to exclude construction activities and personnel for the duration of construction within Mill Creek to ensure protection.

- If frogs accumulate along exclusion fencing, a qualified biologist will relocate them to prevent stranding. Refugia, such as wet boards or cobble, may be placed along fencing to prevent mortality.

Compensatory Mitigation

Off-site improvements or other compensation is not required to offset Project impacts to Foothill Yellow-legged Frogs, as it is anticipated that frogs found within the BSA would be avoided or relocated during construction and habitat disturbance would be temporary. Any temporary disturbance to the stream bed would be returned to pre-project conditions.

Cumulative Impacts

Implementation of avoidance and minimization measures, including pre-construction surveys and relocation of any frogs found by a qualified biologist would reduce the overall contribution of cumulative impacts for Foothill Yellow-legged Frog resulting from completion of the Project. Therefore, no cumulative impacts to special status frogs are anticipated from implementation of the proposed Project.

WESTERN POND TURTLE

Based on molecular analysis, Spinks et al. (2014) proposed recognizing all pond turtles north of San Francisco Bay as *Emys marmorata*; many available literature sources refer to the species as *Actinemys marmorata*. Pond turtles occur in a variety of permanent and semi-permanent freshwater aquatic habitats including lakes, rivers, ponds, creeks, and marshes. Breeding can occur on loose soils on south or west facing slopes. The species is frequently observed basking on exposed banks, logs, and rocks. Winter activity is possible but limited to unusually warm, sunny days; normally pond turtles are dormant during winter months on the north coast; dormancy typically involved burrowing into loose substrate above the high water mark (Thompson et al. 2016). Pond turtles have been documented nesting up to 0.5 kilometers from water (CDFW 2019).

Survey Results

During the May 2019 site visit, one Western Pond Turtle was observed basking on large woody debris adjacent to the bridge. The project area contains suitable habitat for Western Pond Turtles. Due to habitat quality and observations of a Western Pond Turtle within the Project area, it will be assumed that this species may be present during construction.

Project Impacts

Western Pond Turtles could be found if standing water is present during construction. Indirect impacts to Western Pond Turtles would occur from general construction activities, such as increased human presence, noise, and dust within the BSA. Mitigation measures, consistent with SSC status, such as relocation of turtles found in the construction footprint would be required.

Avoidance and Minimization Efforts

- A qualified biologist shall be onsite to provide a worker environmental awareness training (tailboard) for crews at the commencement of construction. The training will include identification and life history of sensitive species (including Western Pond Turtles), applicable regulations, species and habitat protection measures, fines and penalties, and procedures to be followed if sensitive species are observed on-site.

- Disturbance to Western Pond Turtles shall be avoided. A qualified biologist shall conduct a preconstruction survey along Mill Creek within and adjacent to the Project area no more than one week before the start of construction and move any turtles within the construction area downstream and outside of the construction area.

- Exclusion fencing may also be installed, as appropriate, to prevent Western Pond Turtles from entering the work area.

Compensatory Mitigation

Off-site improvements or other compensation is not required to offset project impacts to Western Pond Turtles, as it is anticipated that turtles found within the BSA would be avoided or relocated during construction and habitat disturbance would be temporary. Any temporary disturbance to the stream bed would be returned to pre-project conditions.

Cumulative Impacts

Implementation of avoidance and minimization measures, including pre-construction surveys and relocation of any turtles found by a qualified biologist would reduce the overall contribution of cumulative impacts for Western Pond Turtles resulting from completion of the Project. Therefore, no cumulative impacts to special status turtles are anticipated from implementation of the proposed Project.

MIGRATORY BIRDS

Although no listed or special-status avian species are likely to be present in the BSA during construction, habitat at the Project area and in the vicinity likely serves and breeding and foraging for numerous common avian species. Common, native avian species and their nests receive protection under the Federal MBTA and California FGC.

Avoidance and Minimization Efforts

- Construction shall be restricted to daylight hours.

- Ground disturbance and vegetation clearing shall be conducted, if possible, during the fall and/or winter months and outside of the avian nesting season (March 15 – August 15) to avoid any direct effects to special status and protected birds. If ground disturbance cannot be confined to work outside of the nesting season, a qualified ornithologist shall conduct pre-construction surveys within the vicinity of the Project area, to check for nesting activity of native birds and to

evaluate the site for presence of raptors and special-status bird species. The ornithologist shall conduct a minimum of one day pre-construction survey within the 7-day period prior to vegetation removal and ground-disturbing activities. If ground disturbance and vegetation removal work lapses for seven days or longer during the breeding season, a qualified biologist shall conduct a supplemental avian pre-construction survey before project work is reinitiated.

- If active nests are detected within the construction footprint or within 500-ft of construction activities, the biologist shall flag a buffer around each nest. Construction activities shall avoid nest sites until the biologist determines that the young have fledged or nesting activity has ceased. If nests are documented outside of the construction (disturbance) footprint, but within 500-ft of the construction area, buffers will be implemented as needed. In general, the buffer size for common species would be determined on a case-by-case basis in consultation with the CDFW and, if applicable, with USFWS. Buffer sizes will take into account factors such as (1) noise and human disturbance levels at the construction site at the time of the survey and the noise and disturbance expected during the construction activity; (2) distance and amount of vegetation or other screening between the construction site and the nest; and (3) sensitivity of individual nesting species and behaviors of the nesting birds.

- If active nests are detected during the survey, the qualified ornithologist shall monitor all nests at least once per week to determine whether birds are being disturbed. Activities that might, in the opinion of the qualified ornithologist, disturb nesting activities (e.g., excessive noise), shall be prohibited within the buffer zone until such a determination is made. If signs of disturbance or distress are observed, the qualified ornithologist shall immediately implement adaptive measures to reduce disturbance. These measures may include, but are not limited to, increasing buffer size, halting disruptive construction activities in the vicinity of the nest until fledging is confirmed, placement of visual screens or sound dampening structures between the nest and construction activity, reducing speed limits, replacing and updating noisy equipment, queuing trucks to distribute idling noise, locating vehicle access points and loading and shipping facilities away from noise-sensitive receptors, reducing the number of noisy construction activities occurring simultaneously, and/or reorienting and/or relocating construction equipment to minimize noise at noise-sensitive receptors.

- The amount of construction related disturbance in oak woodland and arroyo willow thicket habitats shall be limited to the extent practicable for project completion.

Compensatory Mitigation

Off-site improvements or other compensation is not required to offset Project impacts to special status birds, as it is anticipated that active nests found within the BSA would be avoided during construction and habitat disturbance would be minimal and temporary.

Cumulative Impacts

Implementation of avoidance and minimization measures, including pre-construction nest surveys by a qualified biologist would reduce the overall contribution of cumulative impacts for special status birds resulting from completion of the Project. Therefore, no

cumulative impacts to special status birds are anticipated from implementation of the proposed Project.

SPECIAL STATUS BATS

A site visit was performed by Caltrans biologists, Christa Unger and Steve Hansen on 08/19/2019. Caltrans biologists observed multiple bats roosting on the bridge during the day. Protocol level surveys to identify bats to the species level and avoidance or mitigation measures are expected to be a requirement from CDFW during the permitting process.

PALLID BAT

The Pallid Bat (*Antrozous pallidus*) is designated as a state Species of Special Concern. This species is a medium sized bat with large ears and long forearms relative to other species. It has yellowish brown to cream colored fur on its back and white fur on its abdomen. Pallid Bats roost alone, in small groups (2 to 20 bats), or gregariously. Day and night roosts include crevices in rocky outcrops and cliffs, caves, trees cavities and hollows, and various human structures such as bridges and barns. Roosts generally have unobstructed entrances/exits, and are high above the ground, warm, and inaccessible to terrestrial predators (Sherwin and Rambaldini 2005, Bat Conservation International 2012). Mating occurs from October to February, birth of offspring from late April to July, and weaning in August. Maternity colonies disperse between August and October (Sherwin and Rambaldini 2005).

Pallid Bats' tendency to roost gregariously and their relative sensitivity to disturbance makes them vulnerable to mass displacement. Roosts can be lost due to timber harvest, recreational activities and demolition or disturbances to occupied man-made structures (Sherwin and Rambaldini 2005, Bat Conservation International 2012). Maternity colonies are especially susceptible to disturbance. Loss or modification of foraging habitat is also a threat (Sherwin and Rambaldini 2005).

Survey Results

A detailed visual survey of the bridge structure was performed in 2012. No Pallid Bats were detected during the 2012 site survey. In addition, no individuals or evidence of bats, such as rub marks or guano, were observed. However, the numerous gaps in the wooden bridge within a riparian habitat provides suitable roosting and foraging opportunities for this species. The nearest CNDDB occurrence record for the Pallid Bat was recorded 6.4 km (4 mi) from the BSA (CNDDB 2019). The existing hill road bridge has a wood deck with small spaces between the decking boards, and some gaps where the joists meet the buttresses. In addition, Caltrans may have detected a Pallid Bat on the bridge in August 2019. Due to habitat quality, the close proximity of CNDDB records, and potential observations of a Pallid Bat in the Project area, it will be assumed that this species may be present during construction.

WESTERN RED BAT

The Western Red Bat (*Lasiurus blossevillii*) is designated as a state Species of Special Concern. Western Red Bats have distinctive red coloration. They are typically solitary animals preferring riparian areas dominated by walnuts, oaks, willows, cottonwoods, and

sycamores. They roost primarily in the foliage of trees or shrubs. Roost sites are generally hidden from view from all directions except below, allowing the bat to drop downward for flight (Bolster 2005, Bat Conservation International 2012). Western Red bats mate in late summer or early fall and give birth in summer. In California, about 83% of the breeding records for Western Red Bat are from the Central Valley with other breeding records in southern California. Although typically solitary, they appear to migrate in groups and forage in close association with one another in summer. This species is considered to be highly migratory. The timing of migration and the extent of summer ranges is poorly understood (Pierson et al. 2006). However, these bats typically disperse throughout low elevation areas of the state (Pierson et al. 2006).

Loss of riparian zones, primarily due to agricultural conversion and dams has reduced both roosting and foraging habitat of Western Red Bats. The intensive use of pesticides in fruit orchards may also constitute a threat to roosting bats and may significantly reduce the amount of insect prey available (Bolster 2005).

Survey Results

No Western Red Bats were detected during the site survey. The riparian habitat within the BSA provides suitable roosting and foraging habitat for the Western Red Bat. The nearest CNDDB occurrence record is 6.4 km (4 mi) from the BSA and dated 1998 (CNDDB 2019). The presence of Western Red Bats is possible, but it is unlikely that maternity roosts will be present in the BSA. Due to habitat quality and the close proximity of CNDDB records, it will be assumed that this species may be present during construction.

HOARY BAT

The Hoary Bat (*Lasiurus cinereus*) is designated as a California Special Status Species and Western Bat Working Group Medium Priority Species. The Hoary Bat is a relatively large bat with brown to rufous with a white “frosting” on the tips (SBDWG 2004). They are found throughout North, Central and South America but not usually in great densities (SDBWG 2004, NatureServe 2019). The species is found throughout California with the exception of xeric desert habitats in the southeast. The species breeds in inland forest habitat and winters along the coast and in the southern portion of the state. The species engages in seasonal movements which results in sexual segregation during the warmer months (males are found in greater numbers in western portions of the state while the females are more common in the northeast). Hoary Bats migrate between the summer and winter ranges from September through November. Mating occurs during migration or on the wintering grounds. Females give birth to one to four pups in May through July of the following year (Harris et al. 2008).

Preferred habitat includes a mosaic of forested habitat for roosting and open/edge habitat for foraging. Hoary Bats are insectivorous and feed primarily on moths (usually over water or over the forest canopy). The species roosts solitarily in dense tree foliage typically near water (species requires water for drinking) (SDBWG 2004, Harris et al. 2008). Threats to the species include deforestation, wind energy developments (common source of mortality for the species), and reduced prey from over application of pesticides (NatureServe 2019).

Survey Results

The nearest CNDDB occurrence record for the Hoary Bat was recorded 6.4 km (4 mi) from the BSA (CNDDB 2019). No Hoary Bats or evidence of bats, such as rub marks or guano, were detected during the site survey. However, the numerous gaps in the existing wooden bridge situated within riparian habitat provides suitable roosting and foraging opportunities for Hoary Bats along Mill Creek. Due to habitat quality and the close proximity of CNDDB records, it will be assumed that this species may be present during construction.

LONG-EARED MYOTIS

The Long-eared Myotis (*Myotis evotis*) is designated as a California Special Status Species and Western Bat Working Group Medium Priority Species. The Long-eared Myotis is a medium-sized bat with pale brown colored fur that is lighter on the belly (SDBWG 2004). They are found throughout California and commonly associated with high desert, mixed coniferous/hardwood forests, pinyon-juniper, mesquite scrub, pine/oak woodland, sequoia forests, and residential areas. The species roosts in low densities in trees, rocks, mines, buildings, bridges, and caves (Arroyo-Cabrales and Álvarez-Castañeda 2017). Caves in Northern California serve as winter hibernacula (Erickson et al. 2002). Females from small maternity colonies during the summer and give birth from one pup from June through July each year (NatureServe 2019). The Long-eared Myotis is a hovering gleaner and feeds on a variety of insects including months, flies, and beetles by plucking prey from foliage or off the ground (Faure and Barclay 1994).

Survey Results

The nearest CNDDB occurrence record for the Long-eared Myotis was recorded 6.4 km (4 mi) from the project area (CNDDB 2019). No Long-eared Myotis or evidence of bats, such as rub marks or guano, were detected during the site survey. However, the numerous gaps in the existing wooden bridge situated within riparian habitat provides suitable roosting and foraging opportunities for Long-eared Myotis along Mill Creek. Due to habitat quality and the close proximity of CNDDB records, it will be assumed that this species may be present during construction.

Project Impacts

The proposed Project would directly impact special status bats, if present, during vegetation trimming or removal and demolition of the existing bridge. Indirect impacts to special status bats would occur from general construction activities, such as increased human presence (especially during the day), noise, and dust within the BSA.

Avoidance and Minimization Measures

- A qualified biologist will provide an on-site worker environmental awareness training (tailboard) for crews at the commencement of construction. The training will include identification and life history of sensitive species (including special status bats), applicable regulations, species and habitat protection measures, fines and penalties, and procedures to be followed if sensitive species are observed on-site.

- Disturbance to special status bat species shall be avoided. Focused seasonally appropriate visual and/or acoustic surveys for bats will be conducted by a qualified biologist to assess the status of bat roosting at the Hill Road Bridge and foliage in the BSA well in advance of the onset of construction activities, including tree trimming or the removal of trees.

- It is recommended that protocol-level surveys occur one to two seasons prior to construction to develop an appropriate bat avoidance or mitigation plan with the CDFW. The bat maternity roosts season is considered to be March 1-August 31, and construction during this time to impact this sensitive biological resources.

- If special status bat species are detected, additional avoidance and minimization measures shall be developed in coordination with CDFW. Additional efforts may include daily construction monitoring for existing bridge removal and tree trimming activities, efforts to exclude bats from the existing bridge structure prior to removal, and slow deliberate removal of the wood decking on the existing bridge with a qualified biological monitor on-site.

- Additional avoidance measures may include bat exclusion on the bridge to be installed between March 1 and April 15 prior to pupping season. The exclusion will include a pre-installation survey of areas occupied by bats to properly install one way exists. This installation will be overseen by a qualified bat biologist and monitored every two weeks leading up to construction by a contract supplied biologist.

Compensatory Mitigation

Compensation of roost habitat may be required to offset Project impacts to special status bats, if surveys determine presence in the bridge or adjacent trees impacted by the Project.

Cumulative Impacts

Implementation of avoidance and minimization measures, including pre-construction surveys by a qualified biologist, would reduce the overall contribution of cumulative impacts for special status bats resulting from completion of the project. If roosting bats are present, lost habitat would be mitigated. Therefore, no cumulative impacts to special status bats are anticipated from implementation of the proposed Project.

SPECIAL STATUS TERRESTRIAL MAMMALS

NORTH AMERICAN PORCUPINE

The North American Porcupine (*Erethizon dorsatum*) is designated as a California Special Status Species. Porcupine are nocturnal, cryptic animals, leading solitary lives except when mating in the autumn. They climb into trees during summer days and stay near a den during winter months. Gestation takes 202 days to complete, one of the longest among rodents, and only one young is born at a time (Roze 2012). Once considered a nuisance species, in recent years few sightings have been made and there is concern that populations in the west are in alarming decline. Loss of habitat, forest succession, poisoning, and low reproductive ability could be contributing to reduced

numbers (Allen and Casady 2012). More information and research is needed to assess this species' vulnerability.

Survey Results

No North American Porcupines were detected during the site survey, though they would be hard to detect during the day. The BSA contains woodland habitat suitable for presence of North American Porcupine, but the existing road(s) may fragment the habitat for this species. The nearest CNDDB record is 7.9 km (4.9 mi) from the BSA and dated 1961 (CNDDB 2019).

Project Impacts

Direct impacts to North American Porcupine, if present, would occur with mortality from vehicle or equipment strikes or during vegetation removal. Indirect impacts to porcupine would occur from general construction activities, such as increased human presence (especially during the day), noise, and dust within the BSA.

Avoidance and Minimization Measures

- A qualified biologist shall provide on-site worker environmental awareness training (tailboard) for crews at the commencement of construction. The training will include identification and life history of sensitive species (including the North American Porcupine), applicable regulations, species and habitat protection measures, fines and penalties, and procedures to be followed if sensitive species are observed on-site.

- If North American Porcupine are detected on-site, the animals shall be allowed to passively relocate (move on their own without human assistance) away from construction activities. CDFW would be contacted for relocation procedures for any porcupine that does not relocate and significantly delays construction.

- Equipment and vehicles stored on-site overnight shall be checked for the presence of any wildlife prior to the start of construction activities each day.

- The construction zone shall be kept free from litter that could attract wildlife by providing suitable disposal containers for trash and all construction-generated material wastes. These containers shall be emptied at regular intervals and the contents properly disposed. The containers shall have covers that can be completely closed and secured.

Compensatory Mitigation

Off-site improvements or other compensation is not required to offset project impacts to North American Porcupine, as it is anticipated that the species would be avoided during construction and habitat disturbance would be minimal and temporary.

Cumulative Impacts

Implementation of avoidance and minimization measures would reduce the overall contribution of cumulative impacts to North American porcupine resulting from

completion of the Project. Therefore, no cumulative impacts to North American Porcupine are anticipated from implementation of the proposed Project.

SPECIAL STATUS INVERTEBRATES

OBSCURE BUMBLE BEE

The Obscure Bumble Bee (*Bombus caliginosus*), is a California Special Status Species. It is primarily black with yellow on the head, forward half of the thorax, and on the fourth tergite (dorsal abdominal segment; Project Noah 2019). Individuals can live approximately one year (Hatfield et al. 2014). They occur in coastal habitat within the fog-belt from British Columbia to southern California (Koch et al. 2012, Hatfield et al. 2014). Preferred plants for foraging include the following genera: *Baccharis, Cirsium, Lupinus, Lotus, Grindelia, Phacelia* (Koch et al. 2012). Their populations have experienced severe declines rangewide (Xerces Society 2019). These declines are poorly understood, largely because they overlap with *Bombus vosnesenskii*, a common bee that is difficult to distinguish from *B. caliginosus* in the field (Xerses Society 2019).

Survey Results

The BSA falls within the current documented range of the Obscure Bumble Bee and includes fog-belt coastal habitat preferred by the species (Hatfield et al. 2014). Preferred plants for foraging (such as *Grindelia* sp, *Baccharis* sp., and *Lupinus* sp.) may be present adjacent to the study area. California Department of Fish and Wildlife records have documented the species from the project vicinity (CDFW 2019). Based on the location of the BSA, the possible presence of host plants in the area, and documented presence of the species in the project vicinity, the Obscure Bumble Bees has a moderate likelihood of occurring within the study area.

Project Impacts

The species is highly mobile and is expected to leave the Project Area during construction activities. Foraging habitat (nectar plants) and nesting habitat in the Project area are not anticipated to be impacted by project activities (plants may occur in the vicinity but are not proposed for removal). In addition, the bee habitat in the Project vicinity is negligible in comparison to considerable suitable habitat in the vicinity of Round Valley. No Project impacts are expected to occur to Obscure Bumble Bees and no avoidance and minimization measures or compensatory mitigation is required.

Cumulative Impacts

No cumulative impacts to Obscure Bumble Bees are anticipated from implementation of the proposed Project.

SPECIAL STATUS FISH

CHINOOK SALMON

The California Coastal (CC) Chinook Salmon (*Oncorhynchus tshawytscha*) is listed as a federally threatened species. Chinook Salmon, also referred to as king salmon, are the

largest of all the Pacific salmon species reaching typical lengths of 0.8 meter (2.6 feet). They are anadromous, meaning they are born and reared in freshwater, migrate to the ocean to feed, and return to their natal streams to spawn and die (NMFS 2007, University of California 2012). Spawning Chinook Salmon typically choose stream beds with large gravel substrate that may be near deep pools, where they build a series of nests or redds. When young Chinook Salmon emerge as fry they are usually swept down to areas of slower water velocities. Juveniles feed primarily on drifting insects of different sizes and stages (NMFS 2007; University of California 2012). Chinook Salmon then emigrate to the ocean where they remain for two to five years and have a primary diet of crustaceans and other fish, fueling rapid growth rates (NMFS 2007).

Survey Results

No Chinook Salmon were detected during the site survey and Mill Creek was dry. Salmon runs are difficult to estimate, but literature suggests that generally less than 1,000 wild adults are returning to the Eel River basin (Yoshiyama and Moyle 2010). As cited in Yoshiyama and Moyle (2010), members of the Covelo Native American Community reported that Chinook salmon have not been observed in the Middle Fork Eel River, Williams Creek and/or Round Valley streams since about 1988. The research shows that this species is no longer likely to be found in Mill Creek. However, the most recent 2016 to 2017 fall run data reported by the Eel River Recovery Project indicate the species' numbers are rising and waves of spawning are now occurring in various locations in the Middle Fork Eel River at Round Valley (Eel River Recovery Project 2017). Fall-run Chinook juveniles outmigrate to the ocean within their first year from April through July. If Chinook Salmon do spawn in either Mill Creek or Middle Fork Eel River, it is unlikely they would be present in the BSA from August through October. August water temperatures near the action area have been documented to meet or exceed the critical thermal maximum (24°C/75°F) for Chinook (CDFG 1997).

STEELHEAD

Steelhead that may occur in the Project area include the Northern California (NC) distinct population segment of Steelhead (*Oncorhynchus mykiss irideus*), which is listed as federally threatened, and summer-run Steelhead, a CESA candidate species. *Oncorhynchus mykiss* have both an anadromous form, known as "steelhead" and a resident form known as "coastal rainbow trout." Both forms are found within the Eel River system with the rainbow trout occurring upstream of the Scott Dam, which is part of the Potter Valley Project (Becker and Reining 2009). Steelhead are usually lighter in color than resident rainbow trout (University of California 2012). Adults typically reach lengths of 0.35 to 0.65 meter (1.2 to 2.1 feet). Steelhead return to their natal streams to spawn with similar spawning requirements to those of the Chinook Salmon. The young often spend two years in freshwater before migrating to the ocean. Steelhead may stay in saltwater for one to two years before returning to their native streams. Most anadromous salmonids die after spawning but steelhead may make numerous trips back and forth between fresh and salt water to breed. Steelhead may spawn up to four times per life span, though many do not survive between breeding cycles (University of California 2012).

Survey Results

Steelhead were documented in lower Mill Creek during an August 29, 1996 survey (CDFG 1996). Age 1-year+ Steelhead were observed from the bank at a location 1,857 feet above the Eel River confluence; seven young-of-year and one 1-year+ Steelhead were captured during sampling at a pool-run complex 35,376 feet above the confluence. Thus Steelhead were observed both above and below the BSA. Presence in Mill Creek is assumed for both summer-run and winter-run populations.

Project Impacts

Dewatering may be necessary prior to construction activities within the bed of Mill Creek, if low flows persists into August. Dewatering could cause fish species to become stranded or trapped. Increased turbidity and bank scour could also occur when flows are diverted or reintroduced. Translocation of salmonids, if present, would require incidental take authorization. Injury or mortality of fish resulting from dewatering activities would be direct exposure to this stressor. Pre-construction surveys and translocation of fish by a contracted biologist would reduce but not eliminate the risk of harm. Increased turbidity or degradation of the creek from project activities would indirectly stress fish species if present and possibly impacting populations over time.

Avoidance and Minimization Measures

- A qualified biologist shall provide on-site worker environmental awareness training (tailboard) for crews at the commencement of construction. The training will include identification and life history of sensitive species (including the special status salmonids), applicable regulations, species and habitat protection measures, fines and penalties, and procedures to be followed if sensitive species are observed on-site.

- If water is present in the creek during construction activities, the flow shall be diverted by either placing sandbags, installing two sets of k-rails and a rubber lining, installing super sacks, or installing sheetpiles along the construction area to allow low flow to continue through the construction area. Depending on the amount of flow present the contractor shall implement one of the above-listed diversion tactics. If flow is shallow, sand bags can be placed along the construction area. If there is a greater amount of flow present either the k-rail, super sack, or sheetpile option could be implemented. If flow is present and dewatering is required, block nets would first be placed at each end and qualified biologists would capture and relocate any native fish or other native aquatic species present in the reach to be dewatered. Once dewatering is implemented and flow is diverted away from the construction area, a biologist would be present and any standing water would be observed for fish. All fish located within the construction area immediately prior to or during dewatering will be captured by seine, dip net, and/or electrofisher and removed by qualified biologists pre-approved by NMFS. Upon Project completion, the dewatering method will be removed from the channel.

- On-site stockpiles shall be isolated with a silt fence, filter fabric, and/or straw bales/fiber rolls. Silt fence and/or fiber rolls will also be placed at bridge abutments, new abutment excavation areas, and any other locations when work could result in loose sediment possibly entering the creek. The silt fence/fiber rolls would be maintained and kept in place for the duration of the project. Any sediment or debris captured by the fence/rolls will be removed before the fence/rolls are pulled. Additional erosion, sediment, and material stockpile BMPs would be employed, as necessary, between work areas and the adjacent waterway. No fill or runoff would be allowed to enter the waterway.

- Disturbance to special status fish species would be minimized. If water is present, surveys for listed fish species shall be conducted by a qualified biologist in pooled or moving water within 200 feet of the bridge seven days prior to the beginning of construction (including any creek diversion or dewatering activities). If discovered, additional fish protection activities would be coordinated with NMFS and may include translocation of Steelhead under incidental take authority. A suitable release location would be identified in advance within Mill Creek, and a translocation plan prepared for agency pre-approval. Translocation would be carried out by a qualified biologist pre-approved by NMFS. Additional efforts may include high visibility fencing to keep construction activities separate from ponded water, and daily construction monitoring. Downed trees, stumps, and other refugias within aquatic areas would remain undisturbed as much as possible.
- No pile driving would occur within the wetted portion of the channel.
- Creek banks would be re-contoured to match the existing bank slopes, or to a maximum 2:1 slope, where existing abutments are removed. After obtaining the engineered grade of the channel banks, approximately 2,600 square feet (90 linear feet) of RSP would be placed on the eastern bank and 3,100 square feet (95 linear feet) of RSP would be placed on the western bank to armor and protect the channel banks from potential erosion
- A Stream Diversion and Relocation Plan will be prepared prior to construction.

Compensatory Mitigation

Off-site improvements or other compensation is not required to offset project impacts to special status salmonids, habitat disturbance would be temporary. Any temporary disturbance to the stream bed would be returned to pre-project conditions.

Cumulative Impacts

Implementation of avoidance and minimization measures, including pre-construction surveys and relocation of any fish found by a qualified biologist if dewatering is necessary would reduce the overall contribution of cumulative impacts for special status salmonids resulting from completion of the Project. Therefore, no cumulative impacts to special status salmonids are anticipated from implementation of the proposed Project.

Special Status Plant Species

Plants discussed are considered to be of special concern based on (1) Federal, state, or local laws regulating their development; (2) limited distributions; and/or (3) the presence of habitat required by the special status plants occurring on site. No special status plants were found to be present within the BSA.

Table 1 lists the special status plants that are known to occur or have potential to occur in the project region. This list of species is based on the U.S. Fish and Wildlife Service USFWS and California Native Plant Society (CNPS) information, and was cross referenced against CNDDB occurrence records. Only species determined to have low to high potential to occur in the BSA are discussed below. Based on literature review, familiarity with flora in the project region, and site survey results, a total of nine special status plant species are considered.

RATTAN'S MILK-VETCH

Rattan's milk-vetch (*Astragalus rattanii* var*. rattanii*) is an annual herb that grows in riverbanks and sandbars of the North Coast Ranges. It is ranked as a CNPS 4.3 plant, indicating limited distribution in California, but not very endangered in California. This species has 2-10, pink-purple flowers with paler tips from April to July.

Survey Results

Rattan's milk-vetch was not detected during the site survey, but the BSA contains gravelly stream banks and collections of this species have been made in the vicinity. Nearest record is 3.37 km (2.1 mi) from project area in 1980 (CCH 2017). The survey was conducted after the blooming window for this species.

MILO BAKER'S LUPINE

Milo Baker's lupine (*Lupinus milo-bakeri*) is a rare, annual, herbaceous species in the legume family. It is endemic to California, and appears to be restricted to the Round Valley in Mendocino County. It is known from only nine CNDDB occurrences in Round Valley near Covelo, one occurrence in Mendocino County near Longvale, and possibly from one occurrence recorded in 1985 in Bear Valley in Colusa County. Identification of the Colusa County occurrence is uncertain. Milo Baker's lupine has a California Rare Plant Rank of 1B.1 meaning it is considered rare and seriously endangered in California by the California Native Plant Society (CNPS). The general habitat for Milo Baker's lupine is cismontane woodland and valley and foothill grassland. Specific habitat includes roadside ditches, dry gravelly areas along roads, and along small streams. In several of the CNDBB occurrences Milo Baker's lupine is described as growing with weedy roadside vegetation (CDFW 2019). The flowering period for Milo Baker's lupine is June-September (CNPS 2019). As an annual plant, Milo Baker's lupine has two important life stages including the flowering, reproductive stage, and the seed bank stage. Milo Baker's lupine can grow from 1 to 2 m tall in one season. Its inflorescences are 5-22 cm in length and its petal color is more or less blue changing to more or less yellow in age.

Survey Results

The BSA's woodlands and disturbed areas in the margins adjacent to the roadway on either side of the Hill Road Bridge give this area potential to support this species. Milo Baker's lupine was not detected during the site survey, but as an annual species a no detection does not rule out seed bank presence. Seven CNDDB occurrence records for Milo Baker's lupine were recorded within 8.05 km (5 mi) of the project location in and around the nearby town of Covelo. The closest is 5.7 km (3.5 mi) recorded in 1986 and the most recent record in 2016, 8 km (4.9 mi) away (CNDDB 2019). Only one Round Valley occurrence, northeast of Covelo, is known to be extant as of 2019. This species is very rare, and has potential to be found in the BSA.

WHITE-FLOWERED REIN ORCHID

The white-flowered rein orchid (*Piperia candida*) has a CNPS 1B.2 rare plant rank, indicating it is rare, threatened, or endangered in California and elsewhere and fairly endangered in California. It is a perennial plant found in both broadleaved and coniferous forests in the region. It is difficult to determine its range as populations often have small numbers and rarely flower.

Survey Results

The BSA contains habitat for this species, including areas with forest duff, mossy banks and rock outcrops. The nearest record for this species is in the East Covelo Quad, though information has been redacted due to its sensitivity (CCH 2017). White-flowered rein orchid was not detected during the site survey.

CYLINDRICAL TRICHODON

The cylindrical trichodon (*Trichodon cylindricus*) has a CNPS 2B.2 rare plant rank, indicating it is rare or endangered in California, but common elsewhere, and fairly endangered in California. This species is a moss that is not endemic to the state. Typical habitat for cylindrical trichodon includes sandy, exposed soil, and roadbanks within broadleafed upland forest, meadows and seeps, and upper coniferous forest. This species is not known to occur within five miles of the BSA and was not observed during the site survey; however, there are occurrence records within Mendocino County.

Survey Results

The BSA contains potential habitat for this species in roadside open areas within the oak woodland, but cylindrical trichodon was not detected during the site survey.

KONOCTI MANZANITA

Konocti manzanita *(Arctostaphylos manzanita ssp. elegans)* has a CNPS 1B.3 rare plant rank, indicating it is rare or endangered in California and elsewhere, but not very endangered in California. It is a California endemic perennial evergreen shrub found in volcanic areas within chaparral, cismontane woodland habitats, and lower montane coniferous forest habitats. (CNPS 2015)

Survey Results

Habitat for this species is present within the BSA and the species may be present. There are documented CNDDB occurrences with 3.5 mi of the project site.

THREE-FINGERED MORNING-GLORY

Three-fingered morning-glory (*Calystegia collina ssp. tridactylosa)* has a CNPS 1B.2 rare plant rank, indicating it is rare, threatened, or endangered in California and elsewhere and fairly endangered in California. It is a California endemic perennial rhizomatous herb found in serpentinite, rocky, gravelly, openings within chaparral and cismontane woodland habitats. (CNPS 2010)

Survey Results

Habitat for this species is present within the BSA and the species may be present. However, there are no documented CNDDB occurrences with 4 mi of the project site.

THIN-LOBED HORKELIA

Thin-lobed horkelia *(Horkelia tenuiloba)* has a CNPS 1B.2 rare plant rank, indicating it is rare, threatened, or endangered in California and elsewhere, and fairly endangered in California. It is a California endemic perennial herb found in mesic openings, sandy areas within Broad-leafed upland forest, valley and foothill grassland, and chaparral habitats. (CNPS 2013)

Survey Results

Habitat for this species is present within the BSA and the species may be present. There are no documented CNDDB occurrences with 5 mi of the project site.

MARSH CHECKERBLOOM

Marsh checkerbloom (*Sidalcea oregana ssp. hydrophila)* has a CNPS 1B.2 rare plant rank, indicating it is rare, threatened, or endangered in California and elsewhere and fairly endangered in California. It is a perennial herb found in mesic areas within meadows, seeps, and riparian forest habitats.

Survey Results

Habitat for this species is present within the BSA and the species may be present. However, there are no documented CNDDB occurrences with 5 mi of the project site.

NUTTALL'S RIBBON-LEAVED PONDWEED

Nuttall's ribbon-leaved pondweed (*Potamogeton epihydrus)* has a CNPS 2B.2 rare plant rank, indicating it is rare or endangered in California, common elsewhere, and fairly endangered in California. It is a California endemic aquatic perennial rhizomatous herb found in mesic areas within marshes, swamps, and assorted shallow freshwater habitats.

Survey Results

Habitat for this species is present within the BSA and the species may be present. However, there are documented CNDDB occurrences with 4 mi of the project site.

Project Impacts

Construction activities within the BSA would directly impact special status plants, if present within the Project limit, by removal of individuals. Temporary impacts would result from increased dust and/or shade from construction equipment on-site.

Avoidance and Minimization Efforts

- A rare plant survey shall be conducted by a qualified botanist or biologist in the BSA during a time when identification is possible (i.e. blooming period) for each of the nine species discussed above and before construction begins. Any rare plants identified during the survey would be avoided, protected from disturbance, or relocated with authorization from the CDFW.
- A qualified biologist will provide an on-site worker environmental awareness training (tailboard) for crews at the commencement of construction. The training will include identification and life history of the nine sensitive plant species discussed above, applicable regulations, species and habitat protection measures, fines and penalties, and procedures to be followed if sensitive species are observed on-site.
- If a special status plant is found within the BSA that cannot be avoided during construction, the biologist, in coordination with CDFW and CNPS, will work to develop additional minimization measures to protect the species' population.

Compensatory Mitigation

Off-site improvements or other compensation is not required to offset Project impacts to special status plants, as it is anticipated that any plants found within the BSA would be avoided during construction.

Cumulative Impacts

Implementation of avoidance and minimization measures, including pre-construction surveys by a qualified biologist or botanist, and coordination with regulatory agencies (if necessary) would reduce the overall contribution to cumulative special status plant impacts resulting from completion of the project. Therefore, no cumulative impacts to special status plants are anticipated from implementation of the proposed project.

Chapter 5 – Conclusions and Regulatory Determinations

Federal Endangered Species Act Consultation Summary

Consultation with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) has not yet been initiated. As reported in Table 1 and discussed in Chapter 4, the Project area falls within critical habitat for two federally listed fish species. Determinations for species and critical habitat are likely or known to occur in the Project area are provided below. All other species and critical habitat described in

Table 1 will not be impacted by the Project and, for federally listed species, the determination is **No Effect.**

Steelhead (*Oncorhynchus mykiss irideus*), Northern California DPS

This species is known to occur within Mill Creek (both winter-run and summer-run) and juveniles could be present adjacent to the construction area. If present, the fish would be relocated. The Project **May Affect and is Likely to Adversely Affect** Steelhead. In addition, the project **May Affect** but is **Not Likely to Adversely Modify Critical Habitat** for Steelhead.

Chinook Salmon (*Oncorhynchus tshawytscha*), California Coast ESU

This species historically may have occurred in Mill Creek but it has not been reported in several decades. It was found to have a low occurrence potential within the BSA, especially when Mill Creek is nearly dry during the summer. Because of continued presence in the Eel River, the proposed Project **May Affect but is Not Likely to Adversely Affect** Chinook. In addition, the Project **May Affect** but is **Not Likely to Adversely Modify Critical Habitat** for Chinook Salmon.

Coho Salmon (*Oncorhynchus kisutch*), southern Oregon / northern California ESU

Although present in the Eel River, Coho Salmon are believed to have been extirpated from the Middle Fork drainage (Brown and Moyle 1991, Yoshiyama and Moyle 2010). In terms of FESA Critical Habitat, all accessible estuarine areas, rivers, and tributaries between the Mattole River in California and the Elk River in Oregon are included in this designation. This designation encompasses the Middle Fork Eel River and Mill Creek in Covelo (64 FR 24049). In addition, the Project **May Affect** but is **Not Likely to Adversely Modify Critical Habitat** for Coho Salmon.

The Biological Assessment determined the proposed Project May Affect, but is Not Likely to Adversely Modify critical habitat for federally listed fish species. The Biological Assessment is included as Appendix G.

Essential Fish Habitat Consultation Summary

The Project makes up a very small portion of the creek and activities will be of a short duration. In addition, mitigation and conservation measures will be implemented to ensure that the Project avoids and/or minimizes any adverse effects. The proposed Project would have minimal to no effects on EFH.

Caltrans has determined that, with implementation of proposed conservation measures the proposed action will not adversely affect EFH for Pacific Coast Salmon.

An expanded discussion regarding EFH is included in the Biological Assessment (Appendix G), which will be reviewed by NMFS as part of the Section 7 consultation for the proposed Project.

California Endangered Species Act Consultation Summary

The north coast clade of the until recently CESA-candidate Foothill Yellow-legged Frog was not listed, and thus no longer is subject to CESA protection

The CESA-candidate summer-run Steelhead may occur within the BSA. As a candidate species, the summer-run Steelhead receives the same protection as if it were CESA-listed. If listing does occur, an ITP would likely be required. Whether listed or not, any fish found during dewatering would be relocated by CDFW approved biologist.

Wetlands and Other Waters Coordination Summary

Concurrent with the site survey, GANDA biologists, Sumudu Welaratna and Sarah Willbrand delineated the ordinary high water mark (OHWM) to identify the lateral limits of non-wetland waters. This was performed in accordance with the procedures outlined in the Army Corps of Engineers (ACOE) Field Guide to the Identification of the OHWM in the Arid West Region of the Western United States Delineation Manual (Lichvar and McColley, 2008). The delineation report is attached in Appendix E. No wetlands were observed onsite outside of the OHWM delineated in the field. Executive Order 11990, Protection of Wetlands (1977), calls for no net loss of habitats referred to as wetlands and established national policy to avoid adverse effects on wetlands whenever there is a practicable alternative. Since the project will not result in the loss of wetlands, a Wetland Only Practicable Finding is not required.

Approximately 580 m^2 (0.14 acre) of jurisdictional waters will experience temporary impacts due to access for this Project which will take place when the creek is dry. Temporary impacts include an access road for construction equipment to access the project area.

A request for verification of the jurisdiction should be submitted to the ACOE. It is anticipated that this Project will qualify under the ACOE Nationwide Permit 14 for linear transportation projects given the minimal to no loss of aquatic habitat resulting from this project as planned.

Because this Project will affect the banks and riparian zone of Mill Creek, it will require a Lake and Streambed Alteration Agreement (1602 permit) with CDFW.

In addition, because this Project will affect Waters of the state (Mill Creek), this project will require a Regional Water Quality Control Board (RWQCB) 401 Water Quality Certification. This project should also obtain California's General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities Order No. 2010-0014-DWQ issued by the state Water Resources Control Board.

Invasive Species

The invasive species below were noted on-site. To avoid the potential spread of any invasive species to or from the construction site, all contractors will follow BMPs including not moving any animal species to or from the Project Area and pressure washing and/or steam cleaning offsite all construction equipment to ensure that all equipment, machinery, rocks, gravel, or other materials are free of non-native plant materials before entering or leaving the Project Area.

American Bullfrog (*Lithobates catesbeiana*)

This species is widespread and very common in California. It is considered an invasive species and a threat to native California Red-legged and Foothill Yellow-legged Frogs. Any bullfrogs captured during pre-construction surveys should be removed.

Ripgut brome (*Bromus diandrus*)

This invasive is found in most of California and out-competes native herbs in understories. The spread of this species is difficult to prevent and is already found in most areas.

Himalayan blackberry (*Rubus armeniacus*)

Himalayan blackberry started out as an agricultural escapee and quickly became invasive in most temperate habitats. The fruits are utilized by many wildlife species as a food source and subsequently aid in its spread after passing through their digestive tracts. This species is also well established in most areas and is difficult to control.

Other

Photographs of site can be found in Appendix B.

MIGRATORY BIRD SPECIES

Avoidance and minimization measures, including a pre-construction nest survey, are proposed for special status and migratory bird species (see Chapter 4).

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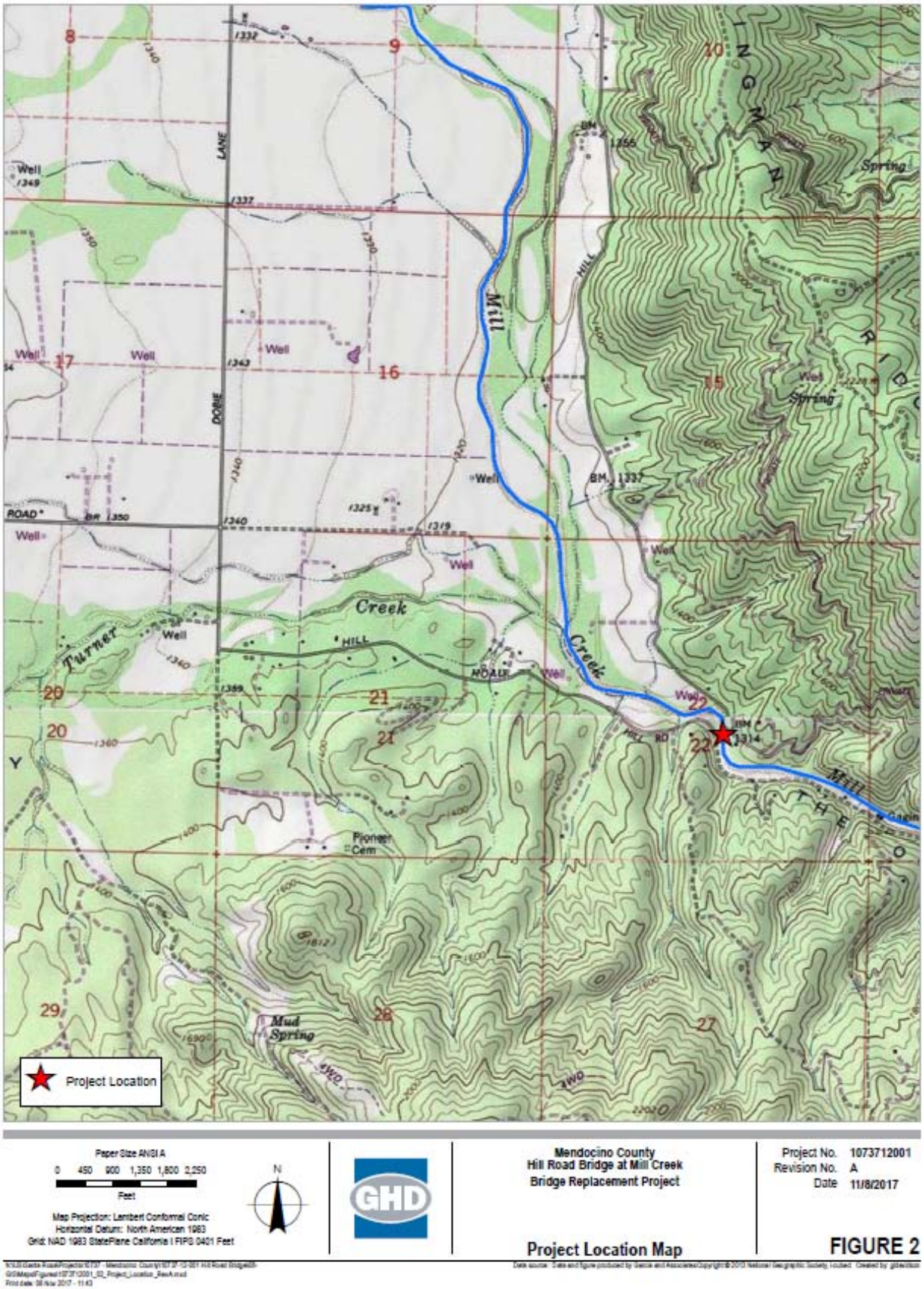
Appendix A – Report Figures

Figure 1. Project Vicinity Map



Appendix A: Report Figures

Figure 2. Project Location Map



Appendix A: Report Figures

Figure 3. Project Impact Area

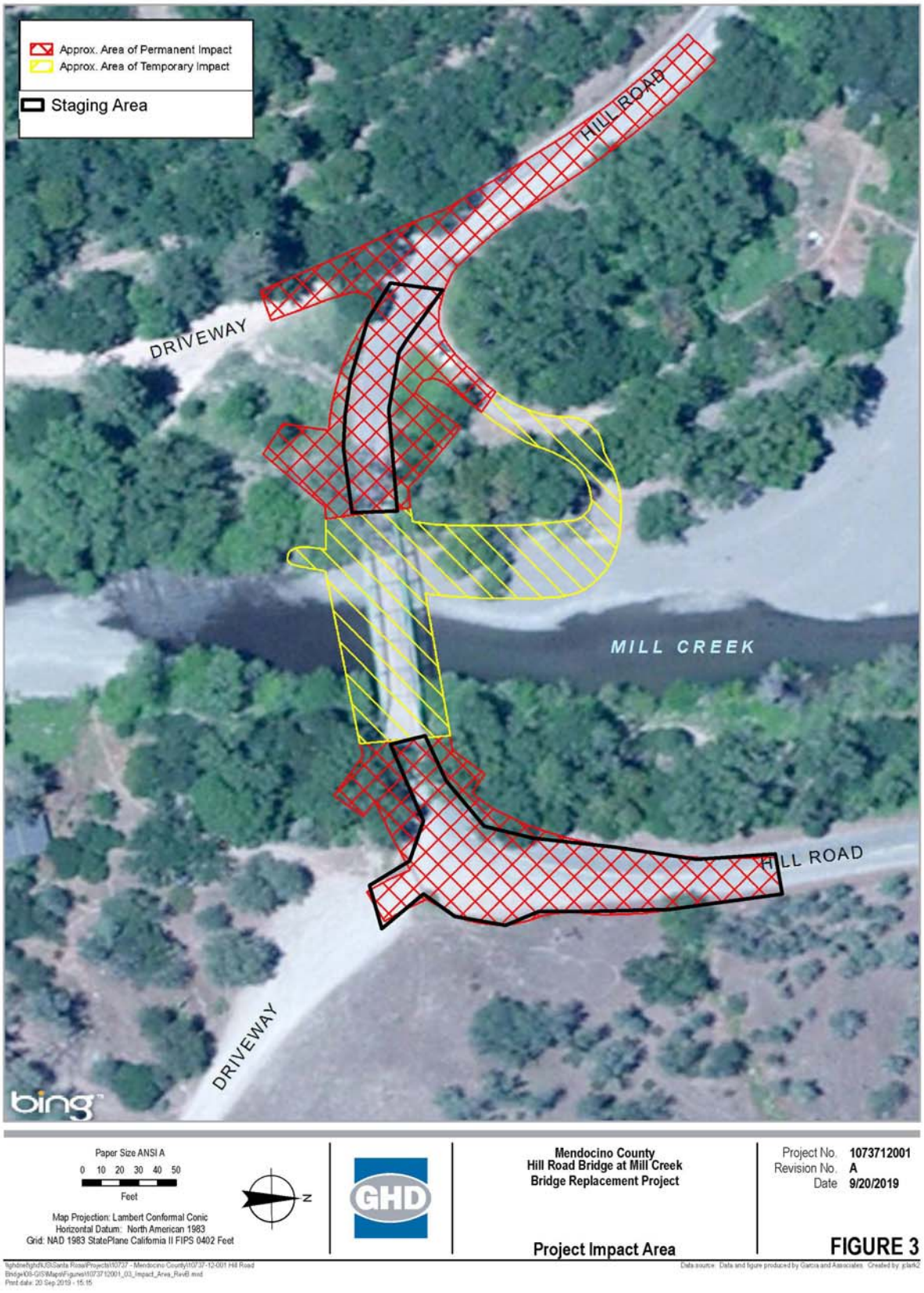


Figure 4. Biological Study Area

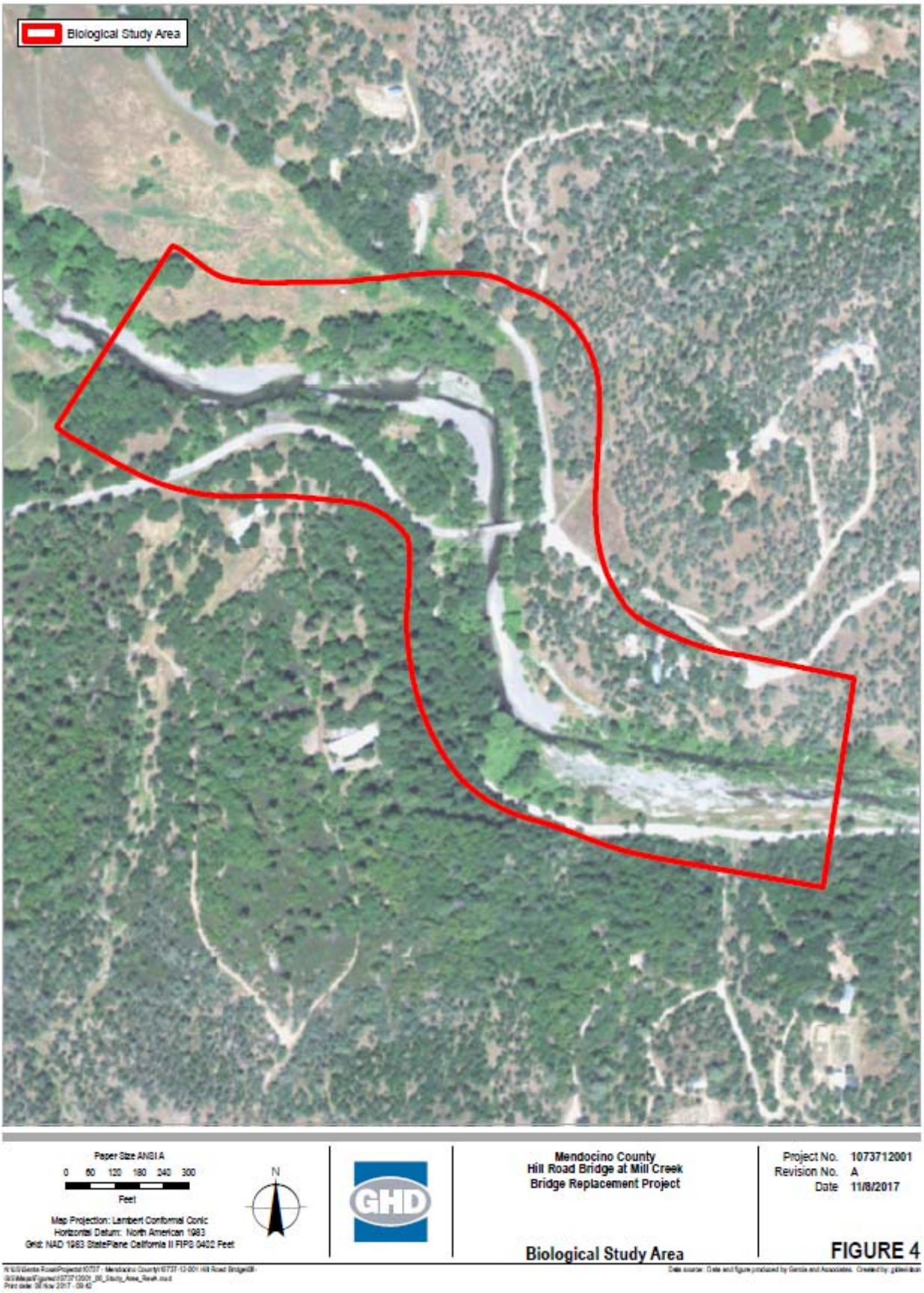
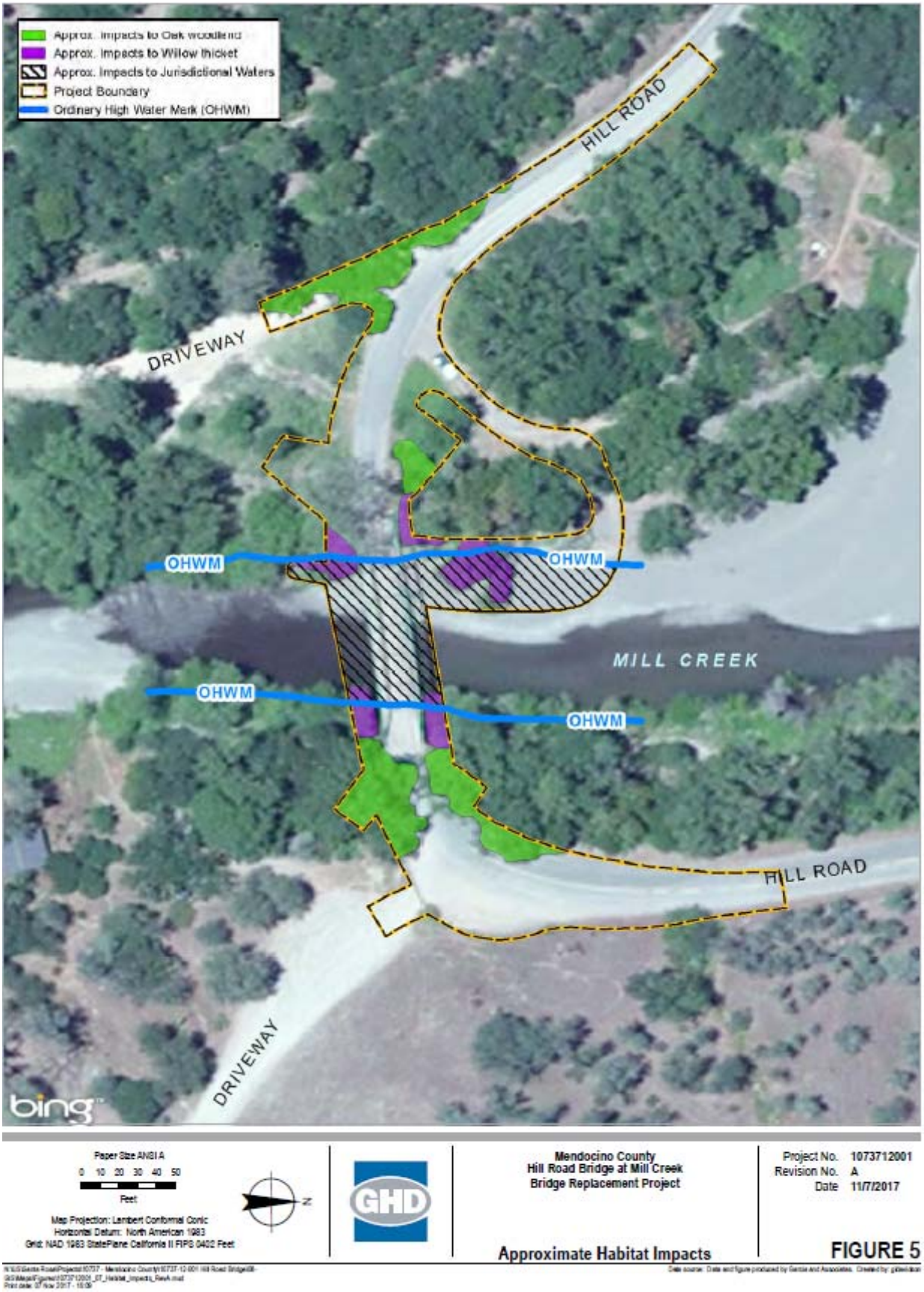
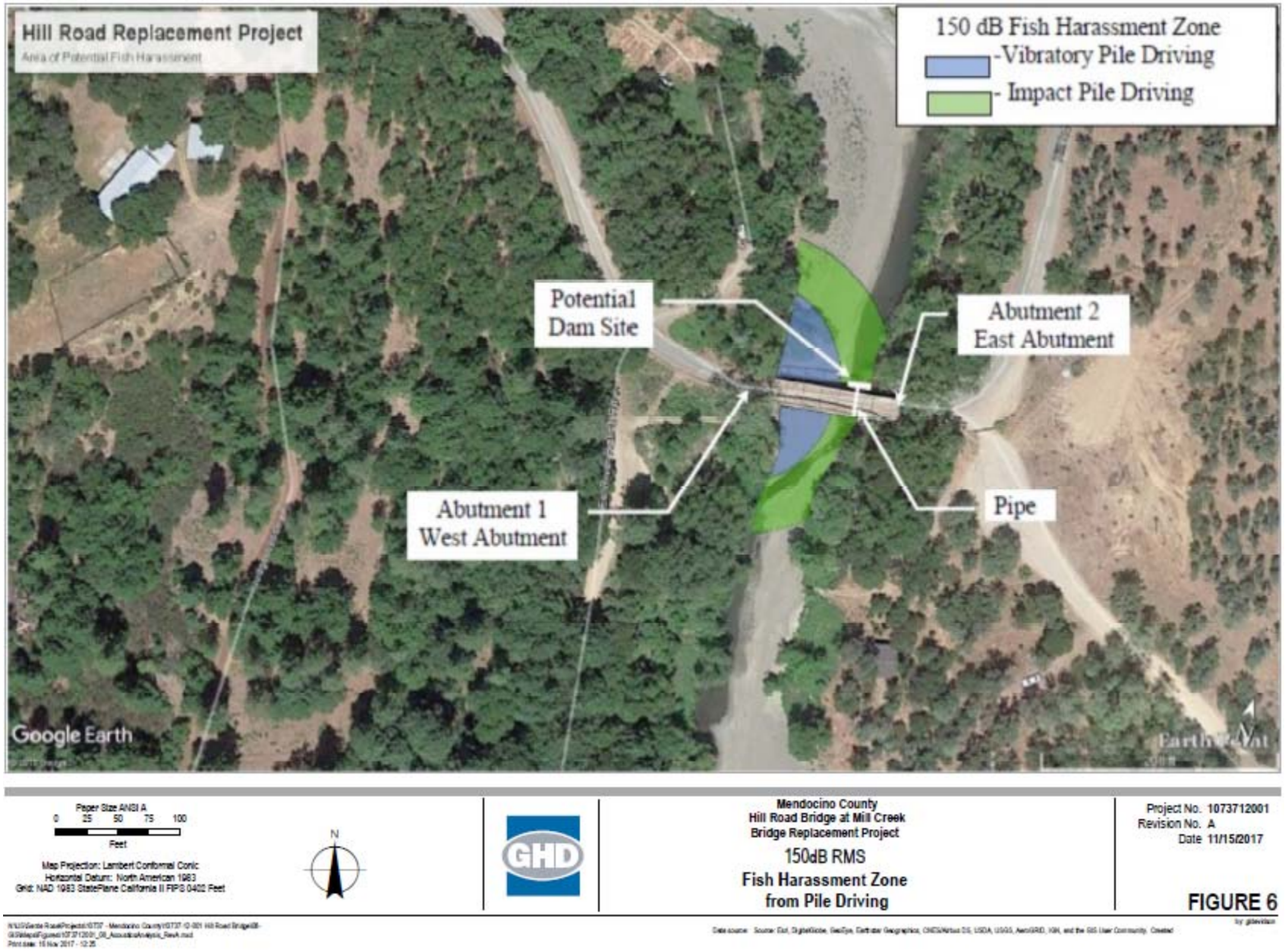


Figure 5. Approximate Habitat Impacts



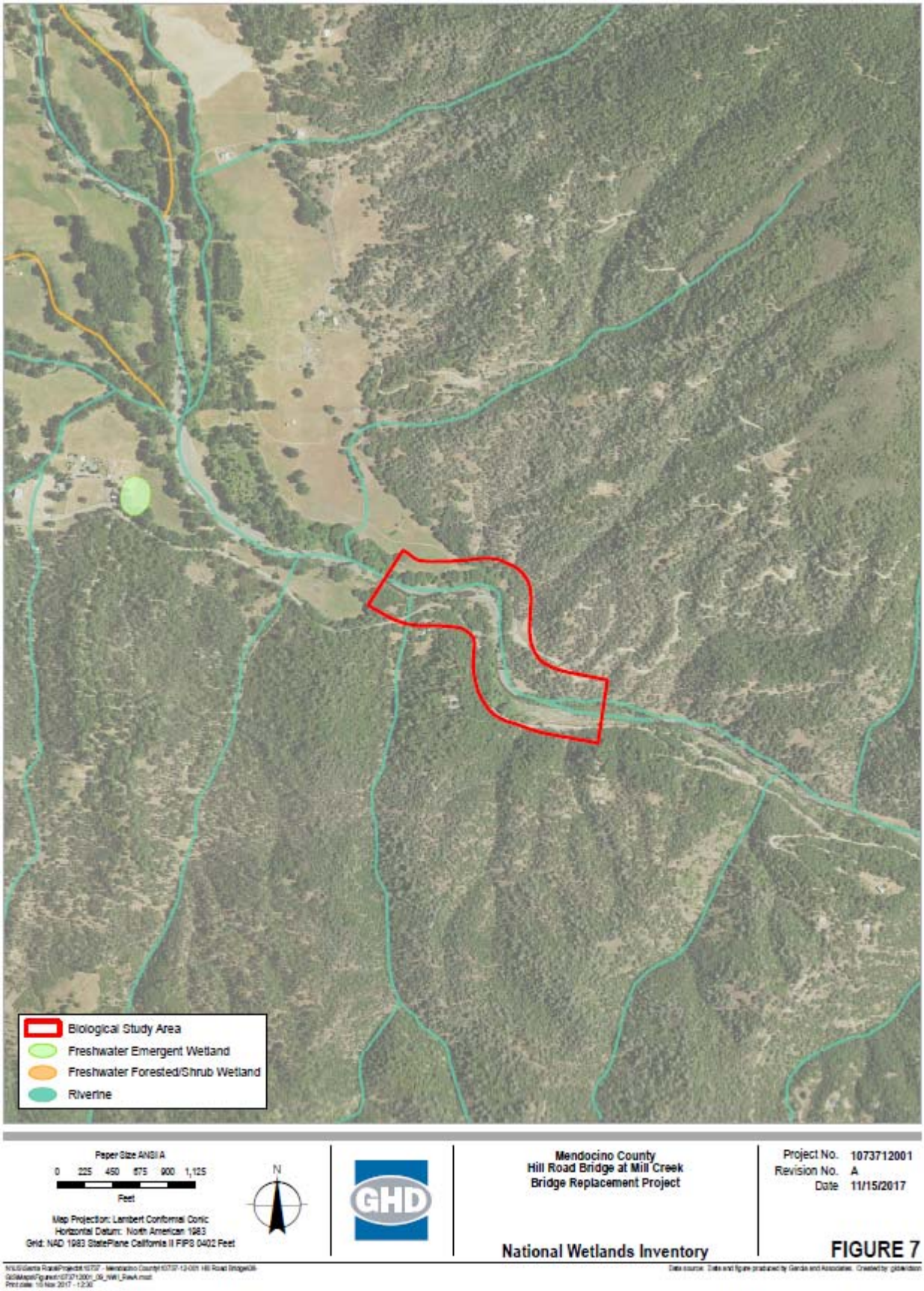
Appendix A: Report Figures

Figure 6. Hill Road Pile Driving 150 dB RMS Fish Harassment Zone.



Appendix A: Report Figures

Figure 7. National Wetlands Inventory



Appendix A: Report Figures

Figure 8. Land Use/Ownership Map

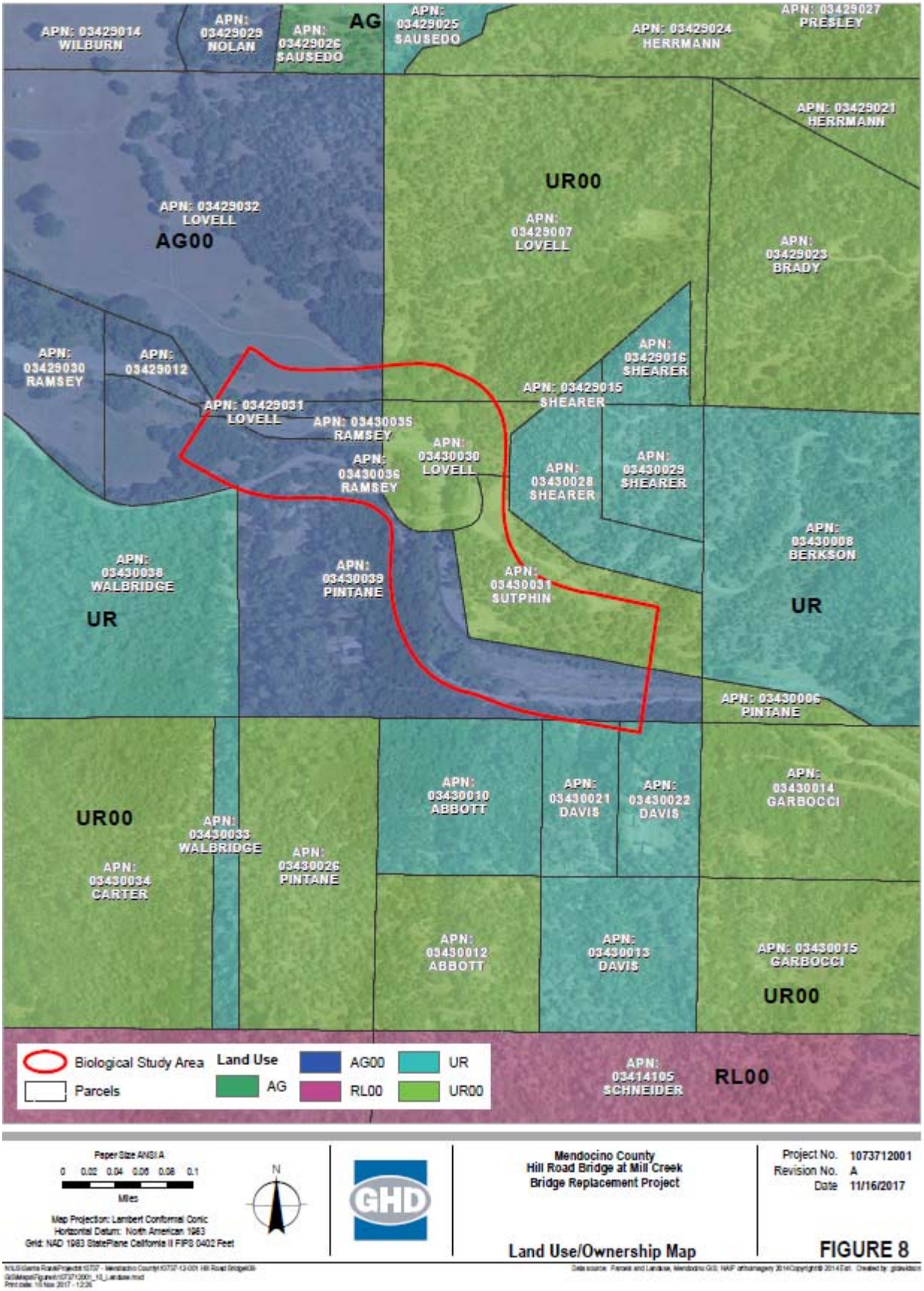


Figure 9. Geology/Soils Map

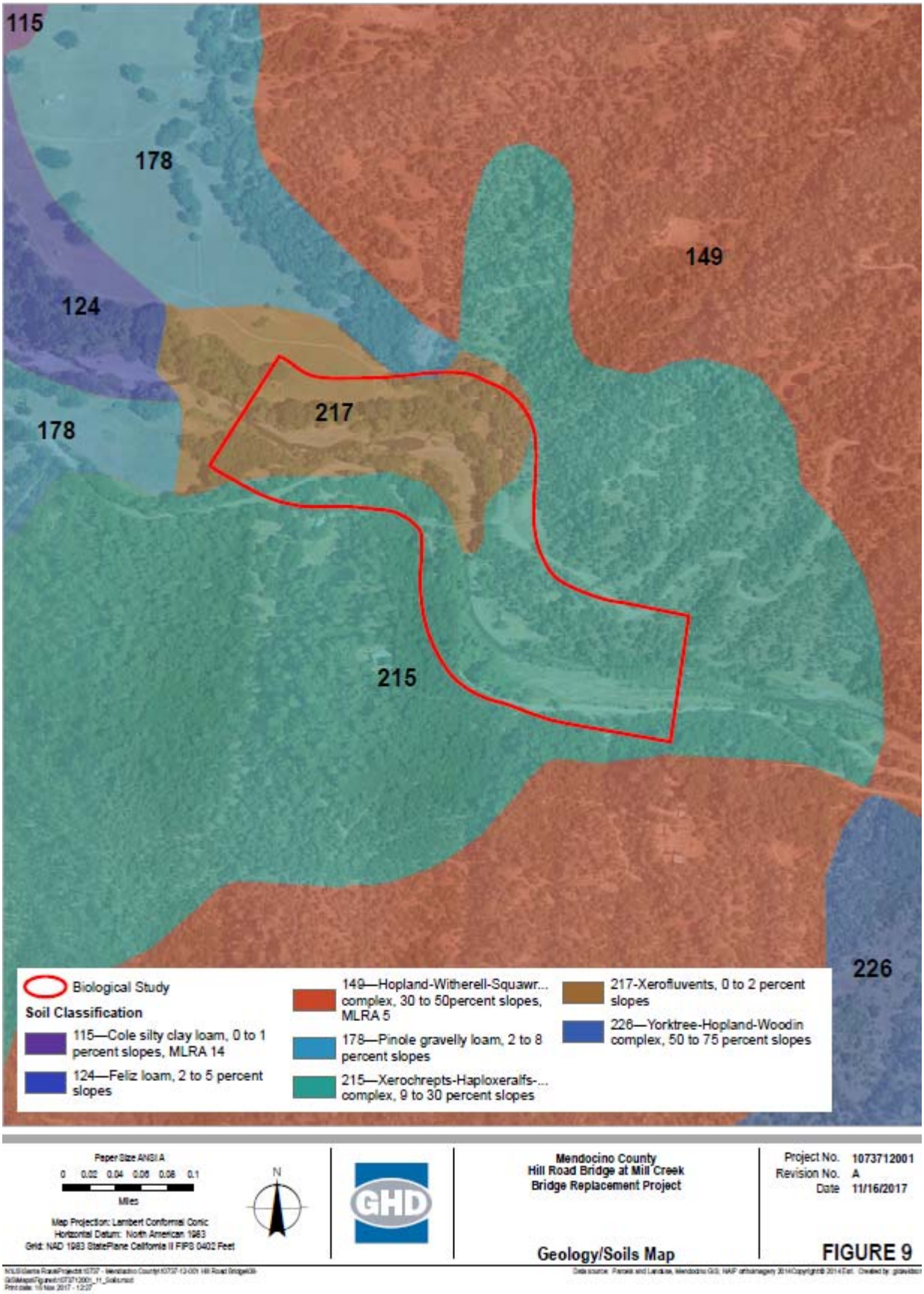


Figure 10. CNDDB 5-mile radius: Plant and Wildlife Occurrences

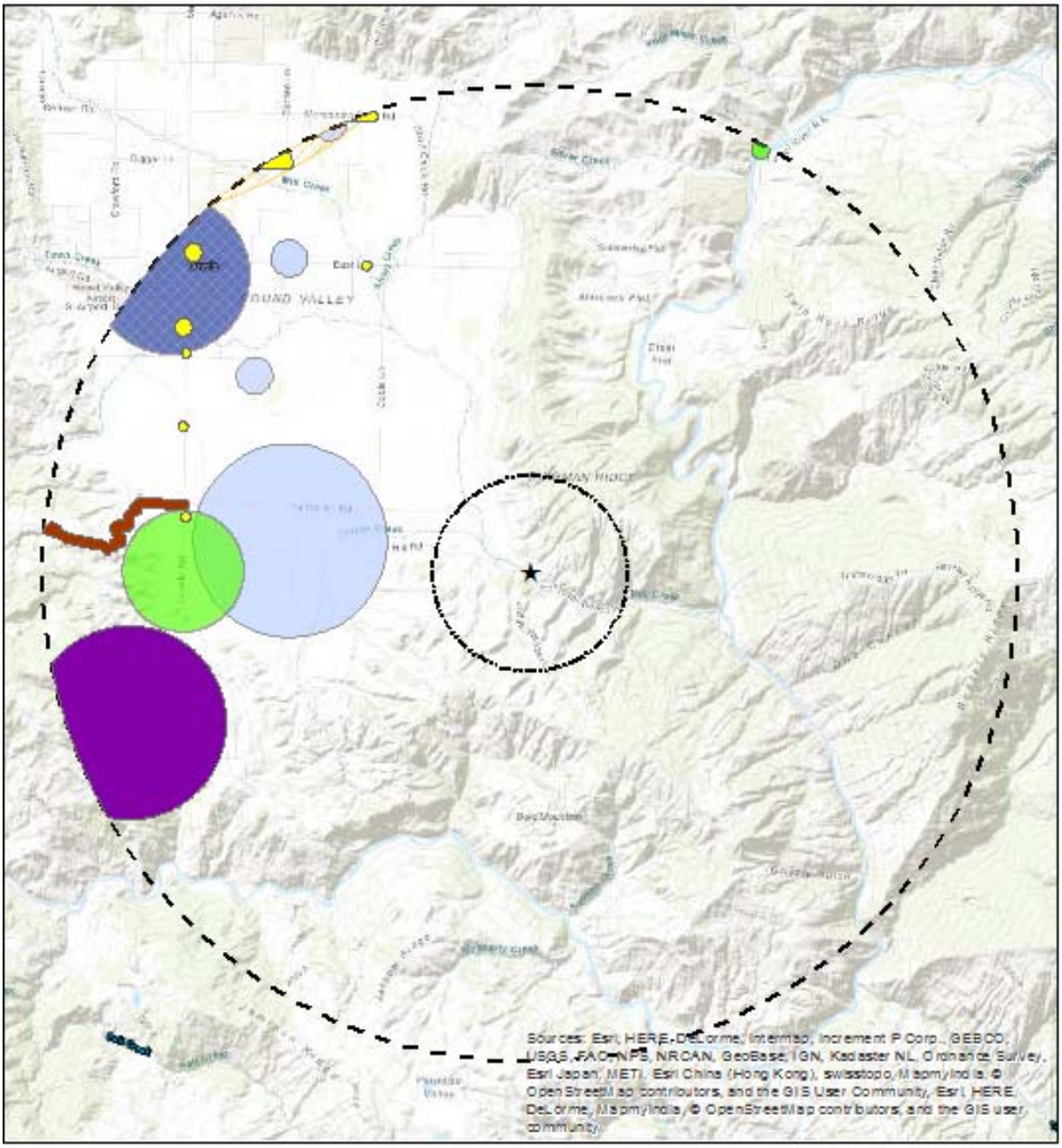


Figure 11. Trees to be Removed

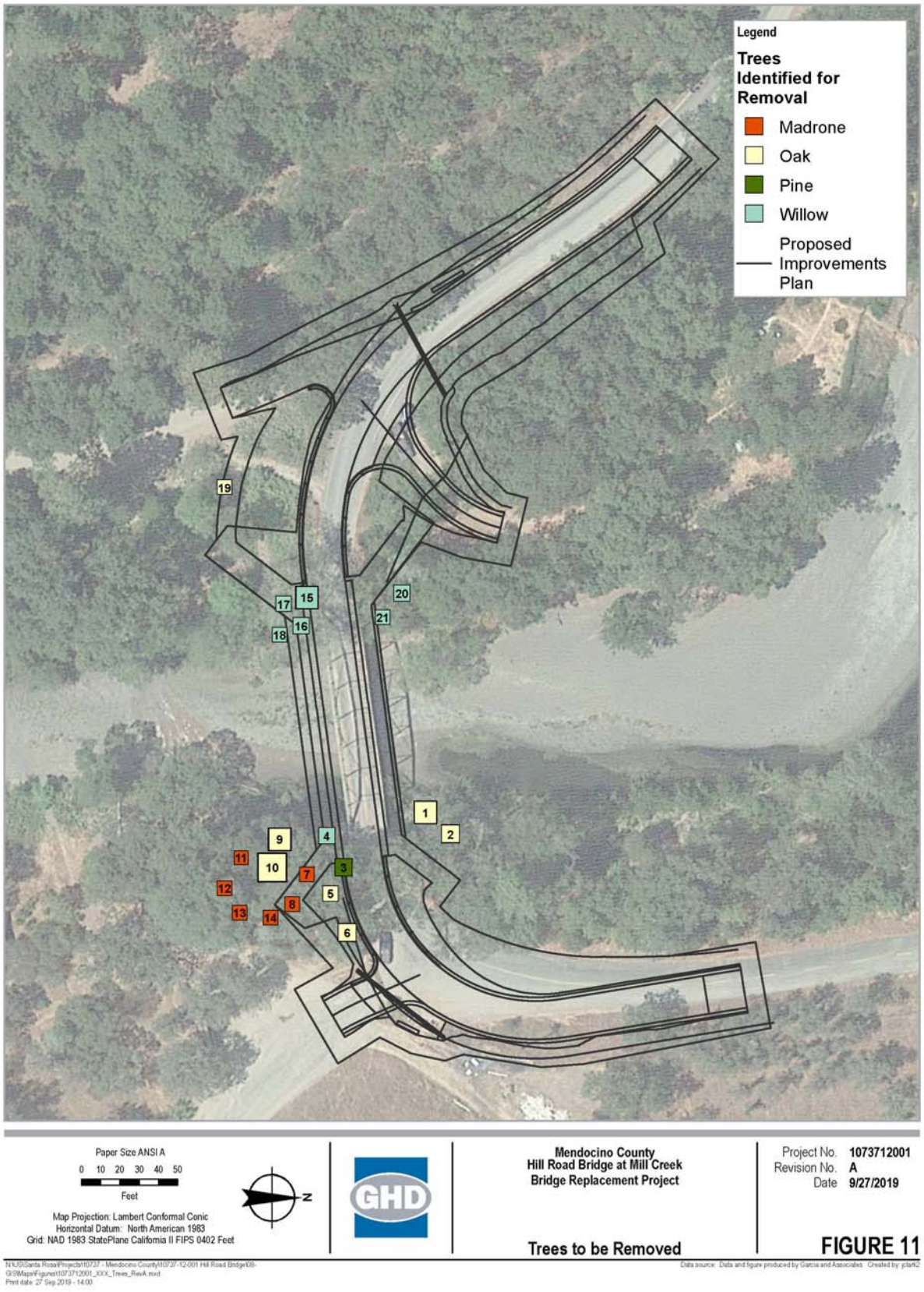
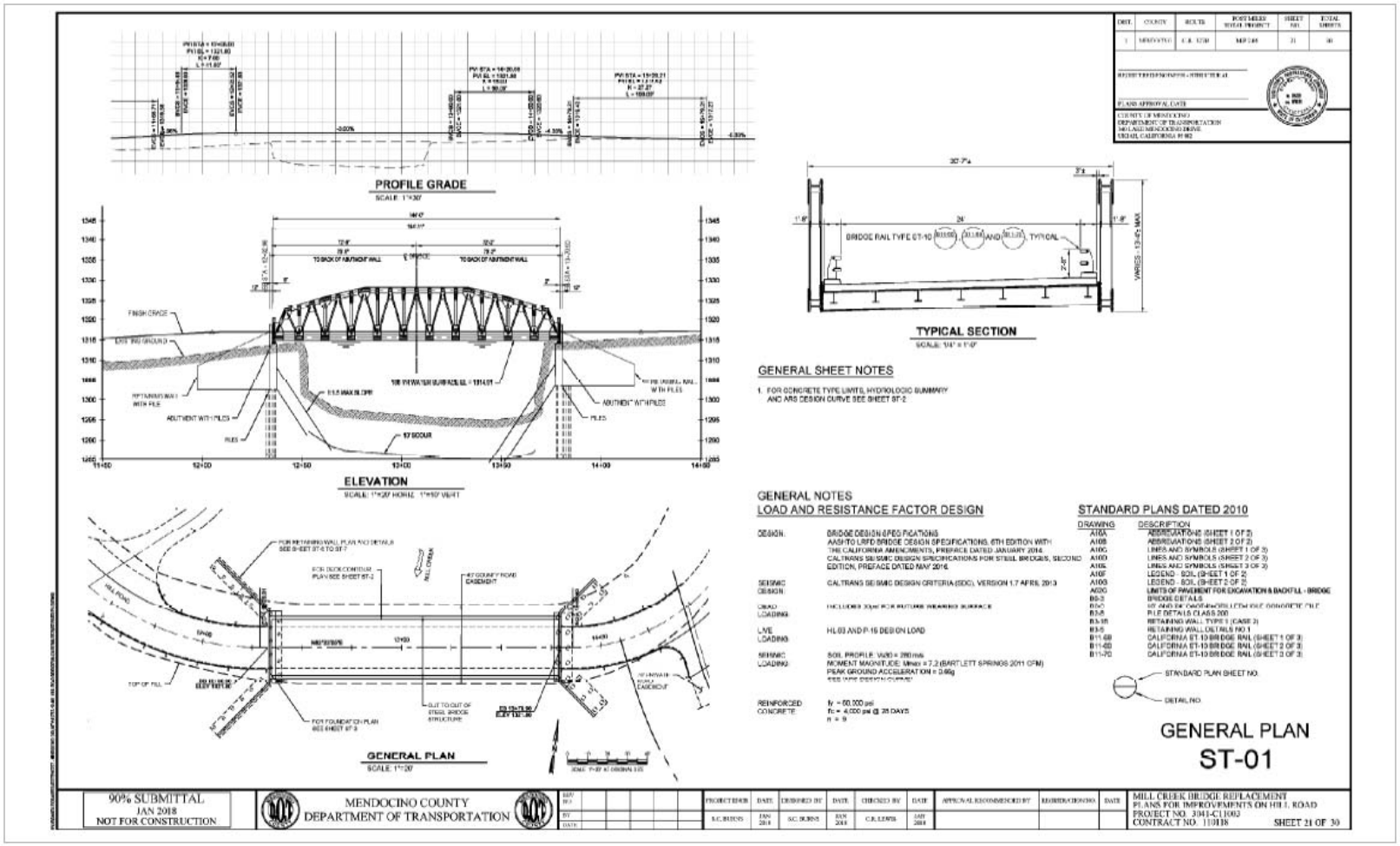


Figure 12. Proposed Bridge Foundation



Mendocino County
Hill Road Bridge at Mill Creek
Bridge Replacement Project

Project No. **1073712001**
Revision No. **A**
Date **12/5/2019**

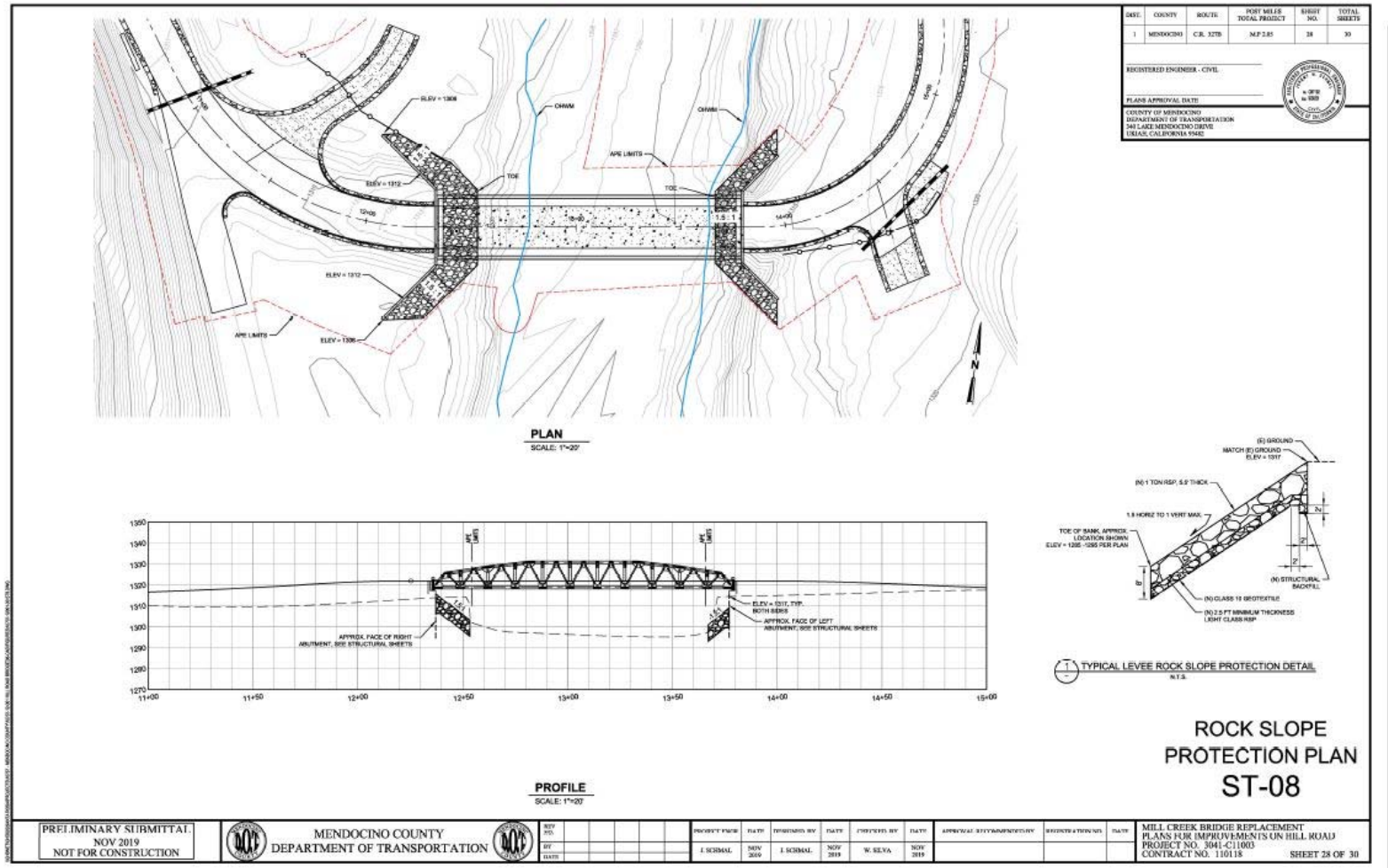
Bridge Foundation

FIGURE 12

101%

Appendix A: Report Figures

Figure 13. Location of Rock Slope Protection



Mendocino County
Hill Road Bridge at Mill Creek
Bridge Replacement Project

Project No. 1073712001
Revision No. A
Date 12/5/2019

Proposed Rock Slope Protection

FIGURE 13

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Data source: . Created by: jclark2

Appendix A: Report Figures

Appendix B – Site Photographs

Appendix B Site Photographs



Photo 1 - View of Existing Bridge Deck, facing west



Photo 2 - View of Existing Bridge from Mill Creek Channel, facing south



Photo 3 - View of stream channel, facing north.



Photo 4 - View of stream channel, facing east.



Photo 5: View of bridge approach, facing west.



Photo 6: View of bridge approach, facing east.

Appendix B: Site Photographs



Photo 7 - View of stream channel, facing northwest.



Photo 8 - View of stream channel, facing east.



Photo 9 - View of stream channel, facing south.



Photo 10 - View of stream channel, facing west.



Photo 11- View of bridge abutment, facing northeast.



Photo 12 - View of bridge abutment, facing southeast.

Appendix C – Database Searches and Special Status Species Tables

Appendix C(1), Table 1. Hill Road Bridge at Mill Creek Bridge Replacement Project – 9-Quad Database Search of CDFW CNDDB centered on project quad (Jamison Ridge) on 11.13.2019. Quads included Jamison Ridge, Covelo West, Covelo East, Newhouse Ridge, Dos Rios, Thatcher Ridge, Willis Ridge, Brushy Mountain, and Sanhedrin Mountain.

SciName	ComName	FedList	CalList	GRank	SRank	RPlantRank	OthrStatus	Habitats	GenHab	MicroHab
Mammals										
Antrozous pallidus	Pallid Bat	N	N	G5	S3		BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern | USFS_S-Sensitive | WBWG_H-High Priority	Chaparral | Coastal scrub | Desert wash | Great Basin grassland | Great Basin scrub | Mojavean desert scrub | Riparian woodland | Sonoran desert scrub | Upper montane coniferous forest | Valley & foothill grassland	Deserts, grasslands, shrublands, woodlands and forests. Most common in open, dry habitats with rocky areas for roosting.	Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.
Corynorhinus townsendii	Townsend's Big-eared Bat	N	N	G3G4	S2		BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern | USFS_S-Sensitive | WBWG_H-High Priority	Broadleaved upland forest | Chaparral | Chenopod scrub | Great Basin grassland | Great Basin scrub | Joshua tree woodland | Lower montane coniferous forest | Meadow & seep | Mojavean desert scrub | Riparian forest | Riparian woodland | Sonoran desert scrub | Sonoran thorn woodland | Upper montane coniferous forest | Valley & foothill grassland	Throughout California in a wide variety of habitats. Most common in mesic sites.	Roosts in the open, hanging from walls and ceilings. Roosting sites limiting. Extremely sensitive to human disturbance.

Erethizon dorsatum	North American Porcupine	N	N	G5	S3		IUCN_LC-Least Concern	Broadleaved upland forest | Cismontane woodland | Closed-cone coniferous forest | Lower montane coniferous forest | North coast coniferous forest | Upper montane coniferous forest	Forested habitats in the Sierra Nevada, Cascade, and Coast ranges, with scattered observations from forested areas in the Transverse Ranges.	Wide variety of coniferous and mixed woodland habitat.
Lasiurus blossevillii	Western Red Bat	N	N	G5	S3		CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern | WBWG_H-High Priority	Cismontane woodland | Lower montane coniferous forest | Riparian forest | Riparian woodland	Roosts primarily in trees, 2-40 ft above ground, from sea level up through mixed conifer forests.	Prefers habitat edges and mosaics with trees that are protected from above and open below with open areas for foraging.
Lasiurus cinereus	Hoary Bat	N	N	G5	S4		IUCN_LC-Least Concern | WBWG_M-Medium Priority	Broadleaved upland forest | Cismontane woodland | Lower montane coniferous forest | North coast coniferous forest	Prefers open habitats or habitat mosaics, with access to trees for cover and open areas or habitat edges for feeding.	Roosts in dense foliage of medium to large trees. Feeds primarily on moths. Requires water.
Martes caurina humboldtensis	Humboldt Marten	N	SE	G5T1	S1		CDFW_SSC-Species of Special Concern | USFS_S-Sensitive	North coast coniferous forest | Oldgrowth | Redwood	Occurs only in the coastal redwood zone from the Oregon border south to Sonoma County.	Associated with late-successional coniferous forests, prefer forests with low, overhead cover.
Myotis evotis	Long-eared Myotis	N	N	G5	S3		BLM_S-Sensitive | IUCN_LC-Least Concern | WBWG_M-Medium Priority		Found in all brush, woodland and forest habitats from sea level to about 9000 ft. Prefers coniferous woodlands and forests.	Nursery colonies in buildings, crevices, spaces under bark, and snags. Caves used primarily as night roosts.
Pekania pennanti	Fisher - West Coast DPS	N	ST	G5T2T3Q	S2S3		BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | USFS_S-Sensitive	North coast coniferous forest | Oldgrowth | Riparian forest	Intermediate to large-tree stages of coniferous forests and deciduous-riparian areas with high percent canopy closure.	Uses cavities, snags, logs and rocky areas for cover and denning. Needs large areas of mature, dense forest.

Taxidea taxus	American Badger	N	N	G5	S3		CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern	Alkali marsh | Alkali playa | Alpine | Alpine dwarf scrub | Bog & fen | Brackish marsh | Broadleaved upland forest | Chaparral | Chenopod scrub | Cismontane woodland | Closed-cone coniferous forest | Coastal bluff scrub | Coastal dunes | Coastal prairie | Coastal scrub | Desert dunes | Desert wash | Freshwater marsh | Great Basin grassland | Great Basin scrub | Interior dunes | Ione formation | Joshua tree woodland | Limestone | Lower montane coniferous forest | Marsh & swamp | Meadow & seep | Mojavean desert scrub | Montane dwarf scrub | North coast coniferous forest | Oldgrowth | Pavement plain | Redwood | Riparian forest | Riparian scrub | Riparian woodland | Salt marsh | Sonoran desert scrub | Sonoran thorn woodland | Ultramafic | Upper montane coniferous forest | Upper Sonoran scrub | Valley & foothill	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils.	Needs sufficient food, friable soils and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.
Reptiles										

Emys marmorata	Western Pond Turtle	None	None	G3G4	S3		BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_VU-Vulnerable | USFS_S-Sensitive	Aquatic | Artificial flowing waters | Klamath/North coast flowing waters | Klamath/North coast standing waters | Marsh & swamp | Sacramento/San Joaquin flowing waters | Sacramento/San Joaquin standing waters | South coast flowing waters | South coast standing waters | Wetland	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation, below 6000 ft elevation.	Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.
Amphibians										
Rana boylii	Foothill Yellow-legged Frog	N	SCT	G3	S3		BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_NT-Near Threatened | USFS_S-Sensitive	Aquatic | Chaparral | Cismontane woodland | Coastal scrub | Klamath/North coast flowing waters | Lower montane coniferous forest | Meadow & seep | Riparian forest | Riparian woodland | Sacramento/San Joaquin flowing waters	Partly-shaded, shallow streams and riffles with a rocky substrate in a variety of habitats.	Needs at least some cobble-sized substrate for egg-laying. Needs at least 15 weeks to attain metamorphosis.
Fish										
Oncorhynchus mykiss irideus pop. 36	summer-run Steelhead Trout	N	SCE	G5T4Q	S2		CDFW_SSC-Species of Special Concern	Aquatic | Klamath/North coast flowing waters | Sacramento/San Joaquin flowing waters	No. Calif coastal streams south to Middle Fork Eel River. Within range of Klamath Mtns province DPS & No. Calif DPS.	Cool, swift, shallow water & clean loose gravel for spawning, & suitably large pools in which to spend the summer.
Insects										

Bombus caliginosus	Obscure Bumble Bee	N	N	G4?	S1S2		IUCN_VU-Vulnerable		Coastal areas from Santa Barabara county to north to Washington state.	Food plant genera include Baccharis, Cirsium, Lupinus, Lotus, Grindelia and Phacelia.
Bryophytes										
Trichodon cylindricus	Cylindrical Trichodon	N	N	G4G5	S2	2B.2		Broadleaved upland forest | Meadow & seep | Upper montane coniferous forest	Broadleafed upland forest, upper montane coniferous forest, meadows and seeps.	Moss growing in openings on sandy or clay soils on roadsides, stream banks, trails or in fields. 35-2005 m.
Dicots										
Anisocarpus scabridus	scabrid alpine tarplant	N	N	G3	S3	1B.3	BLM_S-Sensitive | USFS_S-Sensitive	Upper montane coniferous forest	Upper montane coniferous forest.	Open stony ridges, metamorphic scree slopes of mountain peaks, and cliffs in or near red fir forest. 1550-2350 m.
Arctostaphylos manzanita ssp. elegans	Konocti manzanita	N	N	G5T3	S3	1B.3		Chaparral | Cismontane woodland | Lower montane coniferous forest	Chaparral, cismontane woodland, lower montane coniferous forest.	Volcanic soils. 225-1830 m.
Brasenia schreberi	watershield	N	N	G5	S3	2B.3		Marsh & swamp | Wetland	Freshwater marshes and swamps.	Aquatic known from water bodies both natural and artificial in California. 1-2180 m.
Calystegia collina ssp. tridactylosa	three-fingered morning-glory	N	N	G4T1	S1	1B.2	BLM_S-Sensitive	Chaparral | Cismontane woodland | Ultramafic	Chaparral, cismontane woodland.	Rocky, gravelly openings in serpentine. 605-705 m.
Downingia willamettensis	Cascade downingia	N	N	G4	S2	2B.2		Cismontane woodland | Valley & foothill grassland | Vernal pool	Cismontane woodland, valley and foothill grasslands, vernal pools.	Lake margins. 15-1110 m.
Hesperolinon adenophyllum	glandular western flax	N	N	G2G3	S2S3	1B.2	BLM_S-Sensitive	Chaparral | Cismontane woodland | Ultramafic | Valley & foothill grassland	Chaparral, cismontane woodland, valley and foothill grassland.	Serpentine soils; generally found in sepentine chaparral. 425-1345 m.

Horkelia tenuiloba	thin-lobed horkelia	N	N	G2	S2	1B.2	BLM_S-Sensitive | SB_RSABG-Rancho Santa Ana Botanic Garden	Broadleaved upland forest | Chaparral | Valley & foothill grassland	Broadleafed upland forest, chaparral, valley and foothill grassland.	Sandy soils; mesic openings. 45-640 m.
Iliamna bakeri	Baker's globe mallow	N	N	G4	S3	4.2		Chaparral | Pinon & juniper woodlands	Chaparral, Great Basin scrub, pinyon and juniper woodland, lower montane coniferous forest.	Often in burned areas. Volcanic substrates. 1000-2500 m.
Limnanthes bakeri	Baker's meadowfoam	N	SR	G1	S1	1B.1	BLM_S-Sensitive | SB_USDA-US Dept of Agriculture	Freshwater marsh | Marsh & swamp | Meadow & seep | Valley & foothill grassland | Vernal pool | Wetland	Marshes and swamps, valley and foothill grassland, meadows and seeps, vernal pools.	Seasonally moist or saturated sites within grassland; also in swales, roadside ditches & margins of freshwater marshy areas. 175-915 m.
Lupinus milo-bakeri	Milo Baker's lupine	N	ST	G1Q	S1	1B.1	SB_RSABG-Rancho Santa Ana Botanic Garden | SB_UCBBG-UC Berkeley Botanical Garden	Cismontane woodland | Valley & foothill grassland	Cismontane woodland, valley and foothill grassland.	In roadside ditches, dry gravelly areas along roads, and along small streams. 380-430 m.
Sidalcea oregana ssp. hydrophila	marsh checkerbloom	N	N	G5T2	S2	1B.2		Meadow & seep | Riparian forest | Wetland	Meadows and seeps, riparian forest.	Wet soil of streambanks, meadows. 455-2030 m.
Monocots										
Potamogeton epihydrus	Nuttall's ribbon-leaved pondweed	N	N	G5	S2S3	2B.2		Marsh & swamp | Wetland	Marshes and swamps.	Shallow water, ponds, lakes, streams, irrigation ditches. 295-2640 m.
Habitats										
Upland Douglas Fir Forest	Upland Douglas Fir Forest	N	N	G4	S3.1			North coast coniferous forest		
North Central Coast Summer Steelhead Stream	North Central Coast Summer Steelhead Stream	N	N	GNR	SNR					
Valley Oak Woodland	Valley Oak Woodland	N	N	G3	S2.1			Cismontane woodland		

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Appendix C(2), Table 1. Hill Road Bridge at Mill Creek Bridge Replacement Project – 9-Quad Database Search of CNPS Rare Plant Inventory centered on project quad (Jamison Ridge) on 11.13.2019. Quads included Jamison Ridge, Covelo West, Covelo East, Newhouse Ridge, Dos Rios, Thatcher Ridge, Willis Ridge, Brushy Mountain, and Sanhedrin Mountain.								
Scientific Name	Common Name	FESA	CESA	GRank	SRank	RPlantRank	Habitat	Micro Habitat
Plants								
Anisocarpus scabridus	scabrid alpine tarplant	N	N	G3	S3	1B.3	Upper montane coniferous forest (metamorphic, rocky)	
Arctostaphylos manzanita ssp. elegans	Konocti manzanita	N	N	G5T3	S3	1B.3	Chaparral, Cismontane woodland, Lower montane coniferous forest	volcanic
Astragalus rattanii var. rattanii	Rattan's milk-vetch	N	N	G4T4	S4	4.3	Chaparral, Cismontane woodland, Lower montane coniferous forest	gravelly streambanks
Brasenia schreberi	watershield	N	N	G5	S3	2B.3	Marshes and swamps (freshwater)	
Calystegia collina ssp. tridactylosa	three-fingered morning-glory	N	N	G4T1	S1	1B.2	Chaparral, Cismontane woodland	serpentinite, rocky, gravelly, openings
Downingia willamettensis	Cascade downingia	N	N	G4	S2	2B.2	Cismontane woodland (lake margins), Valley and foothill grassland (lake margins), Vernal pools	
Fritillaria glauca	Siskiyou fritillaria	N	N	G3G4	S3	4.2	Alpine boulder and rock field, Subalpine coniferous forest, Upper montane coniferous forest	serpentinite, talus slopes
Hesperolinon adenophyllum	glandular western flax	N	N	G2G3	S2S3	1B.2	Chaparral, Cismontane woodland, Valley and foothill grassland	usually serpentinite
Horkelia tenuiloba	thin-lobed horkelia	N	N	G2	S2	1B.2	Broadleafed upland forest, Chaparral, Valley and foothill grassland	mesic openings, sandy

Iliamna bakeri	Baker's globe mallow	N	N	G4	S3	4.2	Chaparral, Great Basin scrub, Lower montane coniferous forest (openings), Pinyon and juniper woodland	volcanic, often in burned areas
Limnanthes bakeri	Baker's meadowfoam	N	CR	G1	S1	1B.1	Meadows and seeps, Marshes and swamps (freshwater), Valley and foothill grassland (vernally mesic), Vernal pools	
Lupinus milo-bakeri	Milo Baker's lupine	N	CT	G1Q	S1	1B.1	Cismontane woodland (often along roadsides), Valley and foothill grassland	
Piperia candida	white-flowered rein orchid	N	N	G3	S3	1B.2	Broadleafed upland forest, Lower montane coniferous forest, North Coast coniferous forest	sometimes serpentinite
Potamogeton epihydrus	Nuttall's ribbon-leaved pondweed	N	N	G5	S2S3	2B.2	Marshes and swamps (assorted shallow freshwater)	
Sidalcea oregana ssp. hydrophila	marsh checkerbloom	N	N	G5T2	S2	1B.2	Meadows and seeps, Riparian forest	mesic
Trichodon cylindricus	cylindrical trichodon	N	N	G4	S2	2B.2	Broadleafed upland forest, Meadows and seeps, Upper montane coniferous forest	sandy, exposed soil, roadbanks

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Appendix C(3), Table 1. Hill Road Bridge at Mill Creek Bridge Replacement Project – 9-Quad Database Search of USFWS IPaC centered on project quad (Jamison Ridge) on 11.13.2019. Quads included Jamison Ridge, Covelo West, Covelo East, Newhouse Ridge, Dos Rios, Thatcher Ridge, Willis Ridge, Brushy Mountain, and Sanhedrin Mountain.

SciName	ComName	FedList	CalList	GRank	SRank	RPlantRank	OthrStatus	Habitats	GenHab	MicroHab
Mammals										
Pekania pennanti	Fisher - West Coast DPS	N	ST	G5T2T3Q	S2S3		BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | USFS_S-Sensitive	North coast coniferous forest | Oldgrowth | Riparian forest	Intermediate to large-tree stages of coniferous forests and deciduous-riparian areas with high percent canopy closure.	Uses cavities, snags, logs and rocky areas for cover and denning. Needs large areas of mature, dense forest.
Birds										
Brachyramphus marmoratus	Marbled Murrelet	FT	SE	G3G4	S1		CDF_S-Sensitive | IUCN_EN-Endangered | NABCI_RWL-Red Watch List	Lower montane coniferous forest | Oldgrowth | Redwood	Feeds near-shore; nests inland along coast from Eureka to Oregon border and from Half Moon Bay to Santa Cruz.	Nests in old-growth redwood-dominated forests, up to six miles inland, often in Douglas-fir.
Charadrius alexandrinus nivosus	Western Snowy Plover	FT	N	G3T3	S2S3		CDFW_SSC-Species of Special Concern | NABCI_RWL-Red Watch List | USFWS_BCC-Birds of Conservation Concern	Great Basin standing waters | Sand shore | Wetland	Sandy beaches, salt pond levees & shores of large alkali lakes.	Needs sandy, gravelly or friable soils for nesting.
Coccyzus americanus occidentalis	Western Yellow-billed Cuckoo	FT	SE	G5T2T3	S1		BLM_S-Sensitive | NABCI_RWL-Red Watch List | USFS_S-Sensitive | USFWS_BCC-Birds of Conservation Concern	Riparian forest	Riparian forest nester, along the broad, lower flood-bottoms of larger river systems.	Nests in riparian jungles of willow, often mixed with cottonwoods, with lower story of blackberry, nettles, or wild grape.
Strix occidentalis caurina	Northern Spotted Owl	FT	ST	G3T3	S2S3		CDF_S-Sensitive | IUCN_NT-Near Threatened | NABCI_YWL-Yellow Watch List	North coast coniferous forest | Oldgrowth | Redwood	Old-growth forests or mixed stands of old-growth and mature trees. Occasionally in younger forests with patches of big trees.	High, multistory canopy dominated by big trees, many trees with cavities or broken tops, woody debris, and space under canopy.
Amphibians										

Rana aurora	Northern Red-legged Frog	N	N	G4	S3		CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern | USFS_S-Sensitive	Klamath/North coast flowing waters | Riparian forest | Riparian woodland	Humid forests, woodlands, grasslands, and streamsides in northwestern California, usually near dense riparian cover.	Generally near permanent water, but can be found far from water, in damp woods and meadows, during non-breeding season.
Fish										
Eucyclogobius newberryi	Tidewater Goby	FE	None	G3	S3		AFS_EN-Endangered | CDFW_SSC-Species of Special Concern | IUCN_VU-Vulnerable	Aquatic | Klamath/North coast flowing waters | Sacramento/San Joaquin flowing waters | South coast flowing waters	Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith River.	Found in shallow lagoons and lower stream reaches, they need fairly still but not stagnant water and high oxygen levels.
Plants										
Howellia aquatilis	water howellia	FT	None	G3	S2	2B.2		Aquatic | Freshwater marsh | Marsh & swamp | Wetland	Freshwater marshes and swamps.	In clear ponds with other aquatics and surrounded by ponderosa pine forest and sometimes riparian associates. 1080-1375 m.
Lasthenia burkei	Burke's goldfields	FE	SE	G1	S1	1B.1	SB_RSABG-Rancho Santa Ana Botanic Garden | SB_UCBBG-UC Berkeley Botanical Garden	Meadow & seep | Vernal pool | Wetland	Vernal pools, meadows and seeps.	Most often in vernal pools and swales. 15-580 m.
Lasthenia conjugens	Contra Costa goldfields	FE	N	G1	S1	1B.1	SB_UCBBG-UC Berkeley Botanical Garden	Alkali playa | Cismontane woodland | Valley & foothill grassland | Vernal pool | Wetland	Valley and foothill grassland, vernal pools, alkaline playas, cismontane woodland.	Vernal pools, swales, low depressions, in open grassy areas. 1-450 m.
Trifolium amoenum	two-fork clover	FE	N	G1	S1	1B.1	SB_RSABG-Rancho Santa Ana Botanic Garden | SB_UCBBG-UC Berkeley Botanical Garden | SB_USDA-US Dept of Agriculture	Coastal bluff scrub | Ultramafic | Valley & foothill grassland	Valley and foothill grassland, coastal bluff scrub.	Sometimes on serpentine soil, open sunny sites, swales. Most recently cited on roadside and eroding cliff face. 5-310 m.

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Appendix C(4), Table 1. Hill Road Bridge at Mill Creek Bridge Replacement Project – 9-Quad Database Search of NMFS Database Inventory centered on project quad (Jamison Ridge) on 11.13.2019. Quads included Jamison Ridge, Covelo West, Covelo East, Newhouse Ridge, Dos Rios, Thatcher Ridge, Willis Ridge, Brushy Mountain, and Sanhedrin Mountain.

SciName	ComName	FedList	CalList	GRank	SRank	OthrStatus	Habitats	GenHab	MicroHab
Fish									
Oncorhynchus kisutch pop. 2	Coho Salmon - southern Oregon / northern California ESU	FT	ST	G4T2Q	S2?	AFS_TH-Threatened	Aquatic | Klamath/North coast flowing waters | Sacramento/San Joaquin flowing waters	Federal listing refers to populations between Cape Blanco, Oregon and Punta Gorda, Humboldt County, California.	State listing refers to populations between the Oregon border and Punta Gorda, California.
Oncorhynchus mykiss irideus pop. 16	Steelhead - northern California DPS	FT	N	G5T2T3Q	S2S3	AFS_TH-Threatened	Aquatic | Sacramento/San Joaquin flowing waters	Coastal basins from Redwood Creek south to the Gualala River, inclusive. Does not include summer-run steelhead.	
Oncorhynchus tshawytscha pop. 17	Chinook Salmon - California coastal ESU	FT	N	G5	S1	AFS_TH-Threatened	Aquatic | Sacramento/San Joaquin flowing waters	Federal listing refers to wild spawned, coastal, spring & fall runs between Redwood Cr, Humboldt Co & Russian River, Sonoma Co	

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Appendix D – Hill Road Hydroacoustic Assessment

ANALYSIS OF UNDERWATER SOUND LEVELS – HILL ROAD BRIDGE REPLACEMENT PROJECT in Mendocino County, California

March 10, 2017 (Revised April 14, 2017)

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Project No: 12-057

INTRODUCTION

This study is an assessment of potential sound levels generated by planned pile driving activities involved with the construction of the Hill Road Bridge Replacement Project in Mendocino County, California. The proposed project would replace the existing single-lane bridge with a new two-lane bridge and widened roadway approaches. Construction of the bridge would require installation of small diameter steel shell piles as part of the abutments. This report includes the prediction of underwater sound levels calculated based on the results of measurements for similar projects. Predicted underwater sound levels are compared against interim thresholds that have been accepted by the Federal Highway Administration (FHWA), Caltrans, the National Oceanic and Atmospheric Administration (NOAA) and the California Department of Fish and Wildlife (CDFW). These thresholds are discussed in the report.

Pile driving could produce underwater noise in Mill Creek. Most of the pile driving activities will be out of the creek channel, setback from the creek. At this time, pile driving will occur at Abutment 1, west abutment, where 16-inch (0.41 meter) steel shell piles proposed. Abutment 1 piles will be 45 feet long.

There is no accurate way to predict underwater sound levels from these activities, other than to rely on acoustic data collected from similar projects. Available underwater sound data for projects involving the installation of similar piles were reviewed. The sound levels for pile driving activities proposed by the project were estimated using these data combined with an understanding of how and where these activities would occur. These predictions are essentially a best estimate based on empirical data and engineering judgment, but by their very nature have a certain degree of uncertainty associated with them. The duration of driving for each pile installation was also estimated as part of the noise prediction process. The number of piles strikes anticipated to occur was estimated from these predicted pile driving/installation times. Again, these are based on available data from similar projects and engineering estimates. The availability of data for this type of environment (i.e. shallow water in a relatively narrow creek channel) is limited.

Pile driving also causes elevated airborne sound levels, which usually cause annoyance to humans nearby. There is concern that these sound levels may affect birds in the area. This study also reports airborne sounds associated with pile driving, based on measurements of similar pile driving activities.

UNDERWATER SOUNDS FROM PILE DRIVING

Fundamentals of Underwater Noise

When a pile driving hammer strikes a pile, a pulse is created. This propagates through the pile and radiates sound into the water and the ground substrate as well as the air. Sound pressure pulse as a function of time is referred to as the waveform. Caltrans currently uses peak, root mean square (RMS), and sound exposure level (SEL) as descriptors for impulsive underwater sounds. The peak pressure is the highest absolute value of the measured waveform, and can be a negative or positive pressure peak. The RMS level is determined by analyzing the waveform and computing the average of the squared pressures over the time that comprise that portion of the

waveform containing 90 percent of the sound energy.[1] This RMS term is described as $RMS_{90\%}$ in this report. This has been approximated in the field for pile driving sounds by measuring the signal with a precision sound level meter set to the "impulse" RMS setting ($RMS_{impulse}$). Another measure of the pressure waveform that can be used to describe the pulse is the sound energy itself. The total sound energy in the pulse is referred to in many ways, such as the "total energy flux" (E_T)[2]. The "total energy flux" is equivalent to the un-weighted SEL, a common unit of sound energy used in airborne acoustics to describe short-duration events. The unit is dB re 1µPa^2-sec. In this report, peak pressures and RMS sound pressure levels are expressed in dB re 1µPa; however, in other literature they can take other forms such as a Pascal or pounds per square inch. The total sound energy in an impulse accumulates over the duration of the impulse. How rapidly the energy accumulates may be significant in assessing the potential effects of impulses on fish. Figure 1 illustrates the descriptors used to describe the acoustical characteristics of an underwater pile driving pulse. Table 1 includes the definitions of terms commonly used to describe underwater sounds.

Descriptors such as the peak pressure, $RMS_{90\%}$, and SEL or "total energy flux" are useful descriptors in describing the magnitude of these impulses. The peak pressure refers to the magnitude of maximum pressure fluctuation. The RMS averaged over 90 percent of the impulse includes averaging over a relatively long period of the impulse where the pressure fluctuation is much lower. For instance, about 50 percent of the energy from a typical pile driving impulse accumulates in less than a quarter of the time that 90 percent of the energy accumulates. The SEL or "total energy flux" is normalized to one second and, therefore, is not as useful for discerning differences in impulses where the majority of the energy occurs within 1/10th of a second. However, SEL is useful to researchers in assessing impacts to animals. The pressure waveforms show the individual characteristics of these strikes; however, it is difficult to identify any meaningful differences in the impulses. A plot showing the accumulated sound energy over the duration of the impulse (or at least the portion where much of the energy accumulates) appears to be the best available tool to illustrate the differences in source strength.

[1] Richardson, Greene, Malone & Thomson, *Marine Mammals and Noise,* Academic Press, 1995 and Greene, personal communication.

[2] Finerran, et al., *Temporary Shift in Masked Hearing Thresholds in Odontocetes after Exposure to Single Underwater Impulses from a Seismic Watergun*, Journal of the Acoustical Society of America, June 2002.

Table 1 - Definitions of Underwater Acoustical Terms

Term	Definition
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20 micro pascals (µPa) and 1 µPa for underwater.
Equivalent Noise Level, L_{eq}	The average noise level during the measurement period.
Peak Sound Pressure, unweighted (dB)	Peak sound pressure level based on the largest absolute value of the instantaneous sound pressure. This pressure is expressed in this report as a decibel (referenced to a pressure of 1µPa) but can also be expressed in units of pressure, such as µPa or PSI.
RMS Sound Pressure Level, (NMFS Criterion)	The average of the squared pressures over the time that comprise that portion of the waveform containing 90 percent of the sound energy for one pile driving impulse.[3]
Sound Exposure Level (SEL), dB re 1µPa^2 sec	Proportionally equivalent to the time integral of the pressure squared and is described in this report in terms of dB re 1µPa^2 sec over the duration of the impulse. Similar to the unweighted Sound Exposure Level (SEL) standardized in airborne acoustics to study noise from single events.
Cumulative SEL	Measure of the total energy received through a pile driving event (here defined as pile driving over one day or maximum of 3 piles) that occurs with a day).
Waveforms, µPa over time	A graphical plot illustrating the time history of positive and negative sound pressure of individual pile strikes shown as a plot of µPa over time (i.e., seconds)
Frequency Spectra, dB over frequency range	A graphical plot illustrating the distribution of sound pressure vs. frequency for a waveform, dimension in RMS pressure and defined frequency bandwidth.

[3] The underwater sound measurement results obtained during the Pile Installation Demonstration Project indicated that most pile driving impulses occurred over a 50 to 100 millisecond (msec) period. Most of the energy was contained in the first 30 to 50 msec. Analysis of that underwater acoustic data for various pile strikes at various distances demonstrated that the acoustic signal measured using the standard "impulse exponential-time-weighting" (35-msec rise time) correlated to the RMS (impulse) level measured over the duration of the impulse.

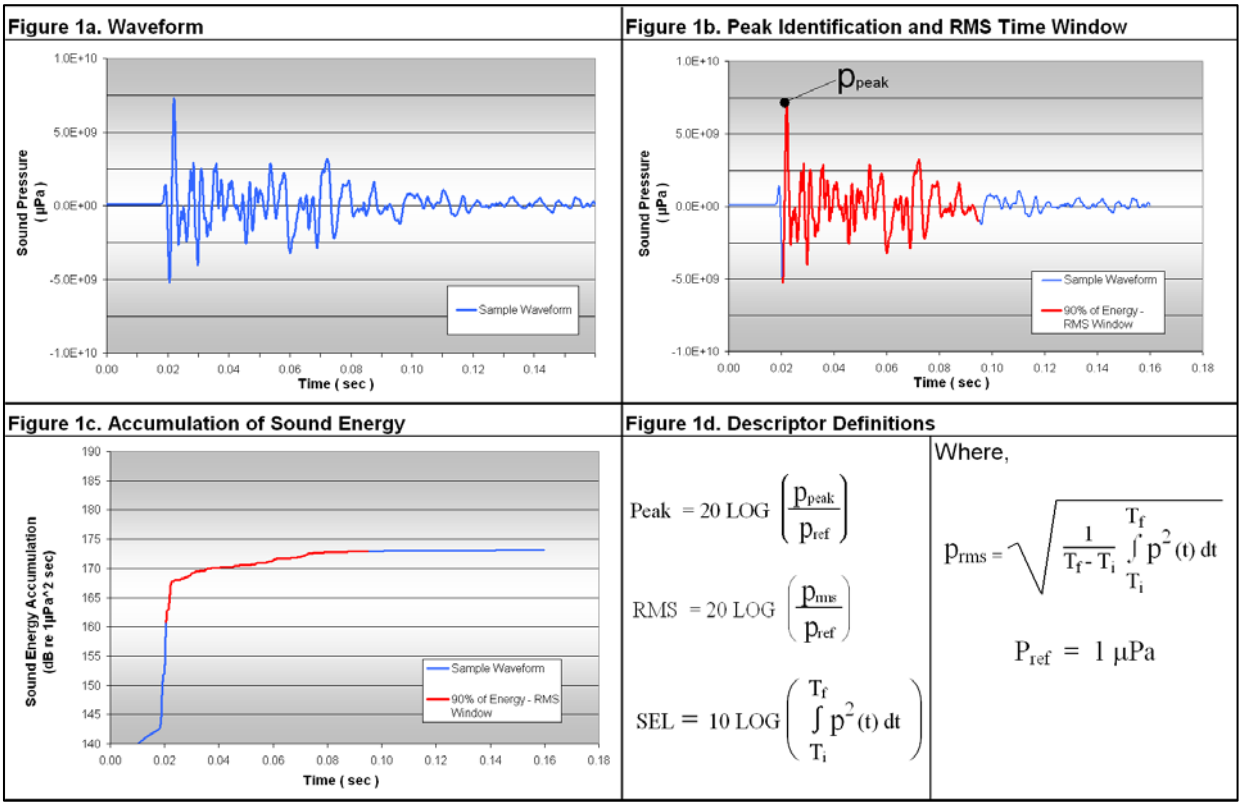


Figure 1 - Characteristics of an Underwater Pile Driving Pulse

Underwater Noise Levels from Construction

The primary type of activity that has the potential to elevate underwater noise levels is the installation of piles. The preferred method for installation of piles for this project includes vibrating and impact driving.

Pile driving in the water causes sound energy to radiate directly into the water by vibrating the pile between the surface of the water and the creek beds, and indirectly because of ground-born vibration at the creek beds. Airborne sound makes an unsubstantial contribution to underwater sound levels because of the attenuation at the air/water interface. Pile driving near the creeks would generate low-frequency ground-born vibration that can cause localized sound pressures in the water that are radiated from the creek beds. A minimum water depth is required to allow sound to propagate. For pile driving sounds, the minimum depth is one to two meters (m). Low frequency (<100 Hz) vibration caused by pile driving and blasting could propagate through the ground only and couple to the water at the creek beds.

The likelihood of pile driving causing high widespread sound levels is low, given the depth of the water and types and sizes of piles under consideration for this project. The water surface is a pressure release zone, where the sound pressure is very low. Underwater sound measurements have shown that levels are considerably lower in the top one meter. Levels are typically highest in the deepest portions of the water column. In deeper water (i.e., 10 meters or deeper), levels are

fairly uniform with depth except in the top two meters where they decrease with decreasing depth.

Hill Road Bridge Assumptions and Impacts

It is expected that the primary pile types to be driven will be as follows:

Permanent Bridge Abutment Piles - Abutment 1 (the west abutment) uses 16-inch diameter pipe piles that are approximately 45-feet in length while Abutment 2 (the east abutment) uses 24-inch diameter cast-in-drilled-hole (CIDH) piers that are approximately 30-feet in length. The Abutment 1 wing walls/retaining walls may also use 16-inch diameter pipe piles or may use 24-inch diameter CIDH piers at this time this has not been decided (for the purpose of this analysis the worst case was used – 16-inch steel shell driven piles). Abutment 2 wing walls/retaining walls use 24-inch diameter CIDH piers that are approximately 30-feet in length. No pile driving will occur in the wetted channel;

- Option A – Impact drive the piles the full depth;
- Option B – Vibrate the piles in the full depth;
- Option C – A combination of first vibrating the piles in half way and driving them to the final tip elevation with a diesel impact hammer.

❖ Pile driving hammers would be on the smaller size, this assessment assumes that a Vibratory hammer similar to an American Pile Driving (APE) Model 200-6 and an impact hammer similar to an APE Model D30-32 diesel impact hammer will be used.

❖ Piles Installed Each Day/ Strikes per Day: It is assumed that all piles could be installed in about four to five days. Sixteen piles at abutment #1 and 22 piles at abutment #2. The number of strikes depends on the equipment the contractor is using; a heavy hammer will use fewer strikes. A rough guess is about 15 blows per foot, and therefore, there will be approximately 4,350 strikes per day.

❖ Source levels were derived from the Caltrans Technical Guidance for assessment and mitigation of the Hydroacoustic Effects of pile Driving[4]. Although the expected levels for the 16-inch piles are expected to be lower than that for 24-inch piles, there is not enough empirical data to support this. Therefore, the 24-inch data was used which would give conservative results.

Table 2 – Data used in analysis

Distances	Hammer Type	Peak	RMS	SEL
14-inch Steel Shell Piles				
10 meters [1]	Diesel Impact	175	150	137
Source: 1 – Willits Bypass Project 2014				

[4] Caltrans. 2015. Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish. Final – November 2015.

- A 25 log attenuation rate or drop off was used to calculate the distances from the source; this attenuation/transmission rate is high due to the fact the noise is being transmitted through a gravel riverbed and not in a water column.

Underwater Sound Thresholds

The National Marine Fisheries Service (NMFS) joined with Caltrans and other regulatory agencies and researchers to form the Fisheries Hydroacoustic Working Group (FHWG). The FHWG and NMFS issued interim guidance on hydroacoustic levels resulting from pile driving activities and subsequently agreed upon dual metric criteria of 206 dB re: 1µPa Peak Sound Pressure Level (SPL) for any single strike and an accumulated SEL of 187 dB re: 1µPa^2-s for all fish greater than 2 grams in size. The agreed upon criteria for fish less than 2 grams lowers the accumulated SEL limit to 183 dB re: 1µPa^2-second. In addition, NMFS has identified a behavioral disturbance threshold of 150 dB re: 1µPa RMS pressure for salmonids as appropriate, until new information and research indicates otherwise. The FHWG and NMFS sound-level criteria are summarized in ***Table 3***. ***Table 4*** shows the calculated distance to the adopted thresholds based on the different options described above.

Table 3 - - FHWG and NMFS Criteria for Evaluating Underwater Noise-related Effects on Fish

Effect	Metric	Fish mass	Threshold
Onset of physical injury	Peak Sound Pressure Level (SPL)	N/A	206 dB (re: 1 µPa)
	Accumulated Sound Exposure Level (SEL)	≥ 2 g	187 dB (re: 1µPa^2-sec)
		< 2 g	183 dB (re: 1µPa^2-sec)
Adverse behavioral effects	Root Mean Square pressure (RMS)	N/A	150 dB (re: 1 µPa)

Table 4 – Calculated Area of Impact

Description of work	Pile Location	Estimated Length (ft)		Distance to Fish Thresholds (m)			
				Cumulative SEL		206 dB Peak Threshold	150 dB RMS Threshold
		Vibratory driving	Impact driving	187 dB[1]	183 dB[1]		
Option A - Abutment Piles Impact Driven	Abutment 1	--	45	--[1]	--[1]	<10	60
Option B - Abutment Piles Vibratory Driven	Abutment 1	45	--	--[2]	--[2]	<10	27
Option C - Abutment Piles Impact and Vibratory Driven	Abutment 1	13	12	--[1]	--[1]	<10	60

[1] This calculation assumes that single strike SELs < 150 dB does not accumulate to cause injury (Effective Quiet).
[2] SEL is currently not used in analysis of vibratory pile driving

Based on the calculations there will be no injury to fish from the proposed impact pile driving; however, regardless what technique is used to install the piles, there would be some harassment to fish if water is present in the channel during project construction. The primary sources of underwater sound would be from the impact driving of round steel piles to support abutment 1, the west abutment of the new bridge. All the piles would be driven outside of the creek channel. The bridge will be supported on pile groups at the two abutments consisting of sixteen (16) 45-

foot piles at the west abutment and twenty-two (22) 25-foot piles at the east abutment. The piles sizes are 16-inch outside diameter and 0.50-inch thick.

Discussion of Underwater Noise Levels from Construction

Pile driving of the steel shell abutment piles near the creek could result in high underwater sound levels. This project includes two abutments that will support the bridge. Pile driving will be required for the West abutment, the piles for the east abutment will be cast-in-drilled-hole (CIDH) piles and pile driving will not be required. The noise from the drilling for the CIDH piles would not be measurable in the water. The distance to the creek from the west abutment piles would vary depending on the creek channel after the winter flows. The current construction plan is to construct a temporary dam approximately 20 feet upstream of the project and divert the creek, if there is any flow, into a pipe to discharge below the project area. The approximate distance used in the analysis were based from the pipe where the diverted creek would be placed, assuming the pipe will be in the center of the creek bed. Abutment 1 is positioned approximately 60 feet (18 meters) from the existing wetted portion of the creek and is about 10 feet above the water line. Construction is scheduled for summer and therefore, it is not expected that pile diving would occur at high water levels where the piles would be driven in the water.

Sounds from similar size steel shell piles have not been measured however, there have been measurements made of larger piles being driven near the water for several bridge projects. Data measured at the Ten Mile Bridge Replacement Project, included larger sized diameter steel shell piles being driven on land near a river. The difference in pile size would require a small adjustment in the source levels to compensate for the difference in the size of the piles. The Willits bypass project had slightly smaller piles which would also require an adjustment in the measured levels. A third project considered is the Orwood Bridge Replacement project, this project included the measurements of 20-inch steel shell piles driven in and near the water for the construction of a temporary trestle. The piles were approximately the same length as the ones proposed for this project and they were installed both with an impact hammer and vibratory hammer.

Ten Mile River Replacement Project

Measurement data from Pier 5 at the Ten Mile River Bridge Replacement project are most similar to the pile driving activities proposed for Abutment 1 at this project. The Ten Mile project included 30-inch diameter steel pipe piles to support the piers for the bridge. Pier 5 of the project was located on land with the closest portion about 60 feet (18 meters) from the edge of the estuary (see Figures 7a and 7b). Ten Mile River resembles more of a tidal estuary than a flowing river at the project site. Water depth is very shallow, less than 1 meter through out much of the river except the deepest parts where water depth can reach almost 2 meters during high tides. Underwater noise measurements during pile installation were made in waters that were 3 feet (1 meter) or deeper.

Pier 5 measurements for vibratory and impact driving were reviewed. At the closest in water position (3 feet or deeper), which was 125 feet (38 meters) from the pile, sound levels from impact pile driving were 172 dB peak and 163 dB RMS. SEL levels were not measured, but are estimated to be about 150 dB. Vibratory driving at this pier produced much lower sound levels of 130 to 142 dB Peak and 125 dB SEL for each second.

Willits Bypass Project

During the construction of the Willits Bypass project 14-inch steel shell piles were driven in the on land for the construction of the Haehl Bridge abutments. Measurements were taken at two locations as required by the monitoring plan. The first location was 35 meters upstream of the bridge and the second position was 60 meters downstream from the bridge. The levels measured at both positions are shown in ***Table 5***.

Table 5 – Measurement Data from Piles driven at the Willits Bypass Project and Orwood Bridge Replacement Project

Distance from Pile	Pile Size	Peak	RMS		One Second SEL		Measurement Location
		Maximum	Average	Range	Average	Range	
Diesel Impact Data							
35 meter	14-inch	170	146	136-151	134	121-139	Willits Bypass
Vibratory Pile Driving Data							
30 meter	30-inch	165[1]	147[1]	--	147[1]	--	10-mile River Bridge

[1] – Adjusted Data

Adjustment to Data

The Vibratory sound levels measured at the Ten Mile River project were adjusted down by 5 dB to compensate for the difference in pile sizes. The Ten Mile Project had 30-inch steel shell piles and the Hill Road Project pile sizes are 16-inch steel shell piles. The reduction was based on measurements of similar sized piles in the water. A 12-inch steel shell pile vibrated in has a peak level of 171 dB and a 36 inch steel shell pile has a peak level of 180 dB. There is a 9 dB peak levels and the larger pile has 3 times more surface area than the smaller pile. The difference is approximately 4.5 dB per equivalent size increase. The difference between the 30-inch piles at Ten Mile River and the 16-inch piles for this project is one doubling in size or the 16-inch pile would be approximately 4.5 dB quitter than the 30-inch piles, when the data is rounded off the Ten Mile River data was adjusted down by 5 dB. No adjustments were made for the 14-inch steel shell piles driven as part of the Willits Bypass project.

Prediction of Noise from Project Pile Driving

Pile driving is expected at the west abutment associated with the bridge. Noise impacts are discussed specifically for each area of pile driving.

Abutment 1- West Abutment

Abutment 1 will have 16 steel pipe piles with a diameter of 16-inches (0.41 m) either installed with an impact hammer, vibratory hammer or combination of the two hammers. Abutment 2 will have 10 steel Cast in drilled hole (CIDH) pipe piles with a diameter of 24-inches (0.61 m) and the wing walls will be supported by an additional 12 24-inch CIDH piles. The CIDH pile will either be rotary drilled or boreholed in, there will be no impact or vibratory pile driving used at Abutment 2. For Abutment 1 three different scenarios were analyzed, as described above, ranging from impact or vibratory driving only to a combination of the two methods.

Impact Driving Results

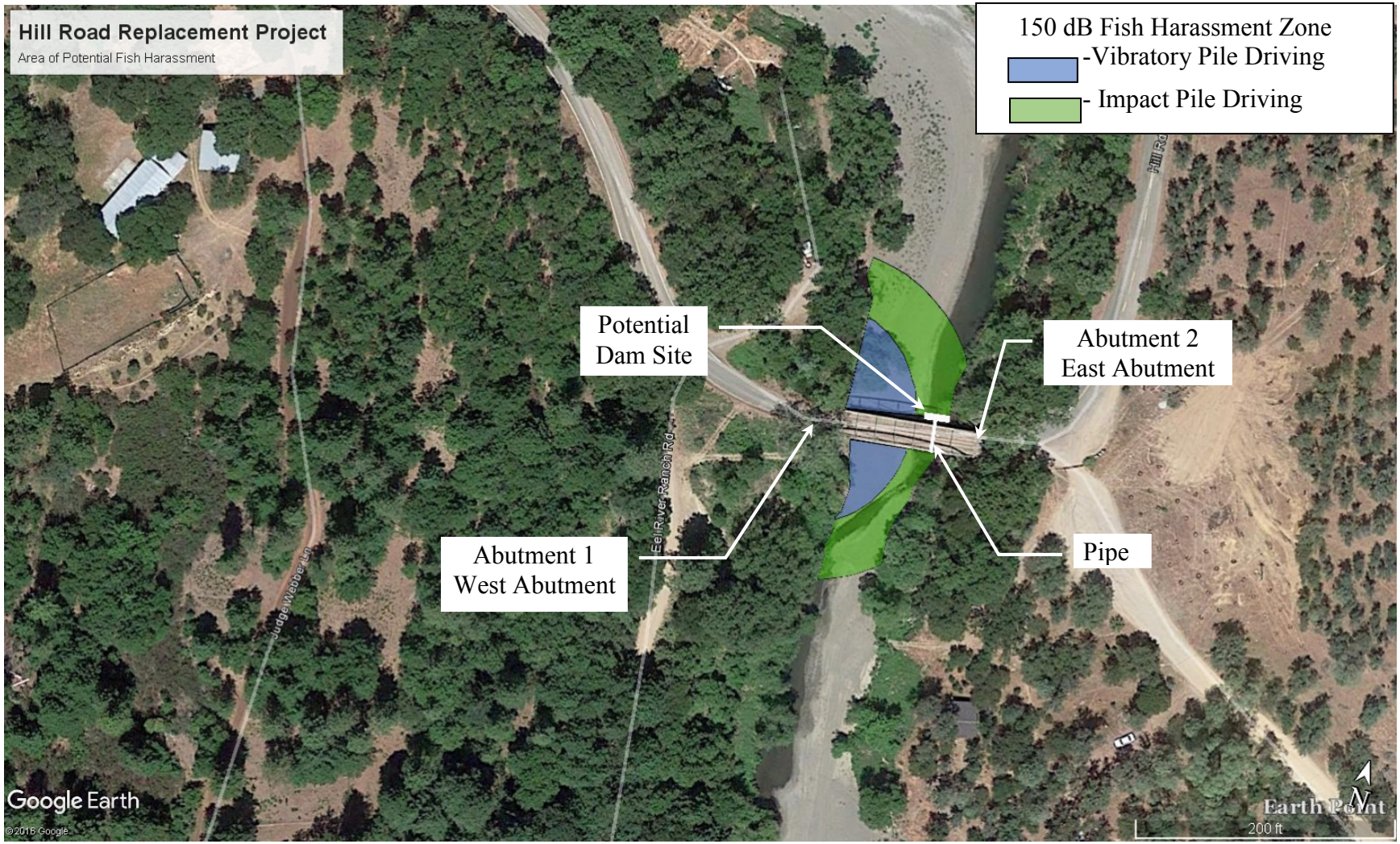
These data indicate that no portion of the creek would receive single strike SEL's above 150 dB during the impact pile driving, therefore there would be no accumulation of the SEL's that would cause injury to fish in the creek. During the impact pile driving there would be portions of the creek about 115 feet (35 meters) from the piles that would have received levels of 150 dB RMS during impact pile installation. ***Figure 2*** shows the limits of the 150 dB fish harassment zone for impact pile driving, the exact limits of the harassment area will depend on the exact location of the stream during the proposed construction season. The aerial photo used for Figure 2 shows the stream bed as it was on May 30, 2014. Attachment 1 shows the calculations used to assess the impacts.

This assessment assumes that there would be 4,350 pile strikes per day at each abutment over a four- to five-day period. With the piles being driven on land, the single strike SEL is anticipated to be less than 150 dB re 1µPa and as such would not accumulate to cause injury to fish in the creek. There would be no exceedance of either the 187 dB or 183 dB re 1µPa^2-sec adopted cumulative SEL criteria and no mitigation would be required.

Vibratory Driving Results

Based on the location of the proposed temporary diversion dam, located at the edge of the area of proposed Archaeological Area of Potential Effects (APE) map provided, the sounds from vibratory installation would not have an injurious impact to the fish species. During the vibratory pile driving there would be portions of the creek about 75 feet (23 meters) from the piles that would have received levels of 150 dB RMS during vibratory pile installation. ***Figure 2*** shows the limits of the 150 dB fish harassment zone for vibratory pile driving, the exact limits of the harassment area will depend on the exact location of the stream during the proposed construction season.

Figure 2 - Hill Road 150 dB RMS Fish Harassment Zone from Pile Driving.



Bridge Demolition

The following section will discuss the demolition of the existing bridge, which will be done all at one time while the roadway is closed and traffic detoured to other routes. To begin with, some assumptions were made regarding the methods used for the demolition of the bridge. The existing bridge deck is wooden. Therefore, concrete demolition would occur at the existing bridge abutments and wing walls. It is assumed that a small hoe ram will be used to demolish the bridge abutments and wing walls.

Use of Hoe Rams

At this time, there is little known about the underwater sound generated by the use of hoe rams and jack hammers in the demolition of bridges. Table 7 shows the measured levels of the abutment at the Mad River Bridge near Arcata, California. The abutment measured was approximately 27 meters from the wetted channel in the Mad River. It is unclear where the channel may be during the proposed construction period, however based on the current photo of Mill Creek the distance to the abutments appears to be between 6 and 21 meters. Based on the varying levels measured at the Mad River Bridge demolition it is difficult to determine an appropriate level to use in the assessment and an adjustment factor for the difference in the distances.

Table 7 – Summary of Pier Demolition Results

Pile Number	Distance Measured (m)	Hoe Ram Size	Peak	Average Peak	Average RMS	Average One-second SEL
9/18/12	27	5,800 ft. lbs.	176	154	147[1]	135

[1] – Estimated Not Measured.

Due to wide range in levels measured and the uncertainty as to the exact location of the Mill Creek it was determined not to make any adjustments in the measured data for the analysis of the demolition of Abutment 1 (west abutment) and Abutment 2 (east abutment). Rather the analysis assumes that the creek is located in the center of the creek bed, approximately 15 meters from either abutment and the maximum levels will be used to show the potential worst case scenario.

Because it is likely that there may be thousands of hoe ram strikes per day, the assumption was made that the injury area (defined as the 183 dB and 187 dB cumulative SEL) is within the distance to effective quiet, 150 dB re 1μPa SEL. Calculations for removing the bridge abutments, assuming the use of a small hoe ram and no attenuation, show that the single strike or one second SEL level of 150 dB would not be measured in the water column and therefore there would be no exceedance of either the 187dB or the 183 dB cumulative SEL threshold during the demolition of either of the abutments. The distance to the limits of the 150 dB fish harassment zone for the abutment demolition would be approximately 20 meters from each abutment, the exact limits of the harassment area will depend on the exact location of the stream during the proposed demolition.

Attachment 1

Hill Road Bridge															***Fish Thresholds***				
Location	Quantity	Diameter in inches	Estimated Pile Embedment Depth (feet)	Assumed depth to vibrate before hammer driving	Estimated Strikes/Piling	Strikes per foot	Strikes per minute (Approx.)	Piles Per Day	Peak Level	RMS Level	Single Strike SEL	Where data calculated from	Distance in Meters	Transmission Loss	Cumulative SEL	Distance to 187 dB Cumulative SEL Critera (m)	Distance to 183 dB Cumulative SEL Critera (m)	Distance to 150 dB RMS Critera (m)	Distance to 206 dB Peak Critera (m)
Abutment 1 - West																			
Impact Drive	16	16	45	45.0	5400	15	42	8	170	150	134	Willits	35	25	--[2]	--[2]	--[2]	35	<10
Vibratory Drive	16	16	45	45.0	2700			8	165	147	147	Ten mile	30	25	--[1]	--[1]	--[1]	23	<10
1/2 Impact Drive	16	16	45	23.0	2760	15	42	8	169	150	134	Willits	35	25	--[2]	--[2]	--[2]	35	<10
1/2 Vibratory drive	16	16	45	22.0	1320			8	165	147	147	Ten mile	30	25	--[1]	--[1]	--[1]	23	<10
Abutment 2 - East																			
Piles are CDIH piles and therre will be no pile driving																			

--[1] No SEL Threshhold for Vibratory pile driving

--[2] Single Strike SEL's less than 150 dB do not accumulate to cause inury to fish

DEMOLITION of EXISTING STRUCTURE

		Blows per day	Peak Level	RMS Level	Single Strike SEL	Where data calculated from	Distance in Meters	Transmission Loss	Cumulative SEL	Distance to 187 dB Cumulative SEL Critera (m)	Distance to 183 dB Cumulative SEL Critera (m)	Distance to 150 dB RMS Critera (m)	Distance to 206 dB Peak Critera (m)
Abutment Removal	Assuming one Hoe Ram during demolition	3500	176	147	135	Mad River	27	25	170	6	7	20	<10

--[2] Single Strike SEL's less than 150 dB do not accumulate to cause inury to fish

Appendix E – Wetland Deliniation

DELINEATION OF WATERS OF THE UNITED STATES

Hill Road Bridge at Mill Creek Bridge Replacement Project

Prepared for:

Mendocino County Department of Transportation
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Prepared by:

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March 2013

DELINEATION OF WATERS OF THE UNITED STATES

Hill Road Bridge at Mill Creek, Mendocino County

C.R. 327B M.P. 2.05, Bridge No. 10C0111, BRLO5910(084)

[EA number]

March, 2013

STATE OF CALIFORNIA
Department of Transportation
and
Mendocino County Department of Transportation

Prepared By: _____ Date: 1/15/14

Sumudu Welaratna, Ecologist / Permitting Specialist
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Recommended
for Approval By: _____ Date: _____
District Biologist:
Phone Number:
Office Name:
District/Region:

Approved By: _____ Date: _____
District Environmental Branch Chief:
Phone Number:
Office Name:
District/Region:

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INTRODUCTION/ SUMMARY OF FINDINGS

Garcia and Associates (GANDA) conducted a field assessment to delineate waters of the United States for the Hill Road Bridge at Mill Creek Bridge Replacement Project in Mendocino County. The project consists of replacing a single lane bridge on Hill Road, which crosses over Mill Creek. A waters delineation was conducted to determine the lateral extent of Mill Creek in the project area. This report describes the methods, results, and conclusions of the waters delineation and is intended to inform a preliminary Jurisdictional Determination by the Army Corps of Engineers (ACOE), pursuant to Section 404 of the Clean Water Act.

This investigation mapped a total of 1.28 acres at the project site; 0.46 acre of this area was found to be jurisdictional Waters of the United States (i.e., Mill Creek as an intermittent, ephemeral stream).

METHODS

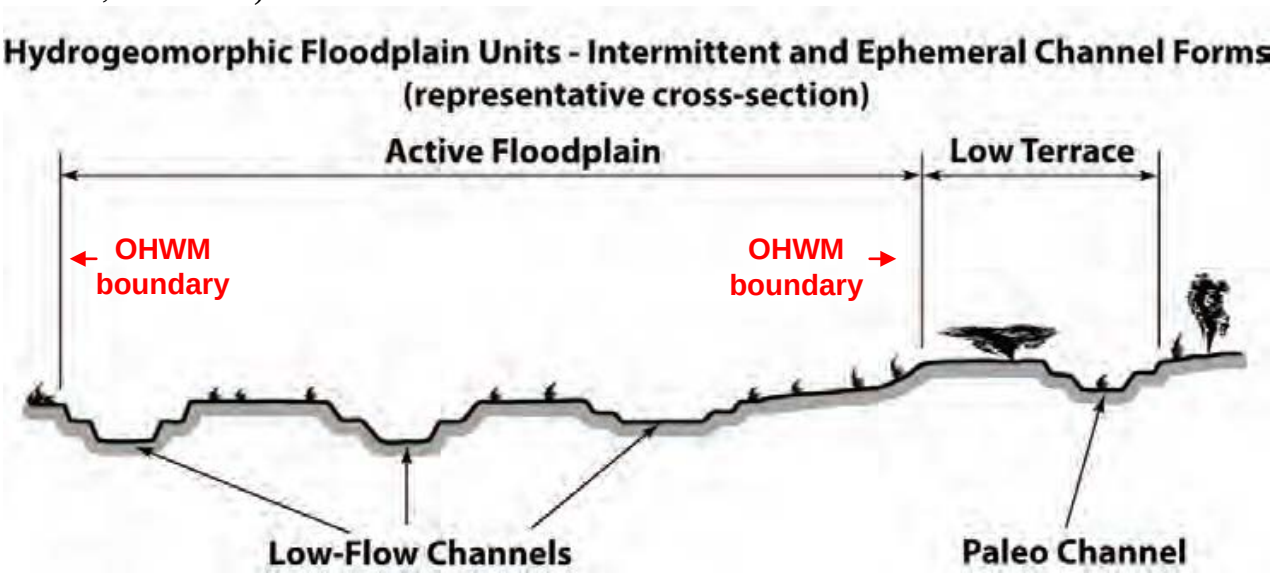
GANDA biologists Sumudu Welaratna, M.S. and Sarah Willbrand, M.S. conducted a waters assessment on August 30, 2012 to determine the boundaries of the jurisdictional waters that will be impacted by the project. The assessment was conducted in accordance with the *Corps of Engineers Wetlands Delineation Manual* (1987) and *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Lichvar *et. al* 2008). These methods included a preliminary review of available information from the project area to characterize the vegetation, soils, and hydrology of the area, followed by field reconnaissance to map waters within project boundaries. Data were recorded on the datasheets provided in Lichvar *et. al* 2008.

The jurisdictional limits of Waters of the United States are defined by using the OHWM. The OHWM is defined at 33 CFR 328.3(e) as:

> The line on the shore 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.

The OHW zone in intermittent and ephemeral channels in the Arid West *is* the Active Floodplain (Lichvar *et. al* 2008). Due to the transitory nature of traditional OHWM indicators in arid environments, the [outer] limit of the Active Floodplain is the only reliable and repeatable feature in terms of OHW delineation (Lichvar *et. al* 2006 in Lichvar *et. al* 2008). Therefore, this report refers to the OHWM as the boundary between the Active Floodplain and the Low Terrace (Figure 1).

Figure 1. Channel and floodplain features of intermittent and ephemeral channels (adapted from Lichvar, *et. al* 2008)



The boundaries of the Low-Flow Channel, Active Floodplain, and Low Terrace were identified and recorded in the field on the data sheets and with GPS waypoints. Characteristics used to delineate these boundaries were: change in sediment texture, change in total vegetation cover, change in vegetation maturity (successional stage), change in dominant species present, and other relevant site features.

Hydrophytic vegetation was identified in the field based on species composition and corresponding wetland indicator status. Percent coverage of each species was visually estimated. The indicator status of each dominant species was determined based on the *National List of Vascular Plant Species that Occur in Wetlands* (Lichvar and Kartesz 2012). Wetland indicator species include those listed as obligate (OBL), facultative wetland (FACW), or facultative (FAC) in the *National List*, for California Region 0 (Reed 1988). Upland indicator categories include facultative upland (FACU), or upland (UPL). Wetland indicator status categories are described in Table 1. Sediment size was estimated based on the Wentworth size classification system printed on the data sheets. The soil type was classified based on the descriptions in the Natural Resources Conservation Science Web Soil Survey report for the Study Area (Appendix A).

Table 1. Wetland Indicator Categories (adapted from Reed 1988)

Indicator Category	Wetland Occurrence
Obligate wetland species (OBL)	Occurs almost always in wetlands (estimated >99% probability of occurring in a wetland)
Facultative wetland species (FACW)	Usually occurs in a wetland (estimated 67-99% probability of occurring in a wetland)
Facultative species (FAC)	Equally likely to occur in a wetland or a non-wetland (estimated 33-67% probability of occurring in a wetland)
Facultative upland species (FACU)	Usually occurs in non-wetlands (estimated 1-33% probability of occurring in a wetland)
Obligate upland species (UPL)	Occurs in wetlands in another region, but occurs almost always under natural conditions in non-wetlands in Region 0 (California) (estimated <1% probability of occurring in a wetland).
Not Listed (NL)	Plants not listed in Lichvar and Kartesz (2012) are assumed to be obligate upland species (UPL)

STUDY AREA

The Study Area is located in the North Coast Region of California, in Mendocino County in the Jamison Ridge 7.5-minute U.S. Geological Survey quadrangle, Section 22, Township 22N, Range 12W, at latitude 39.749115° N and longitude -121.181364° W (Figures 2 and 3). The town of Covelo is located approximately 4.5 miles northwest. The Study Area is located at the southeast edge of the broad flat Covelo Valley, where it joins a riparian canyon between two foothills of the Coast Ranges. The surrounding vicinity is mostly rural blue oak woodland, with a fe scattered houses.

The Study Area encompasses a 1.28-acre area around the Hill Road Bridge, which crosses Mill Creek (Figure 4). Mill Creek is part of the Eel River Watershed. It connects to the Middle Fork Eel River approximately two miles downstream (east), which connects to the Eel River and eventually flows to the Pacific Ocean just south of Humboldt Bay (Figure 2). In the Study Area, Mill Creek has a negligible gradient and takes the form of a Discontinuous Ephemeral Channel (Lichvar, *et. al* 2008), which is characterized by alternating erosional and depositional reaches that are constantly in flux. At the time of the August 30, 2012 site visit, the majority of the study area was dry, with only two disconnected pools in the Low-Flow Channel. There were no adjacent wetlands at the site. Vegetation in the Study Area consisted of riparian trees and an herbaceous understory.

Appendix A of this document contains a Custom Soil Resource Report for the project site from the Natural Resource Conservation Service. The report states that the project site is underlain by Xerofluvents and the Xerochrepts-Haploxeralfs-Argixerolls complex. The Xerofluent soils are mapped generally in the creek bed and banks at the bridge site, with the Xerochrepts complex mapped on the slopes up from the creek banks.

Xerofluvents are hydric soils typically found in floodplains and are comprised of alluvium derived from sedimentary rock. A typical profile is sandy loam from 0 to 15 inches, sand from 15 to 29 inches, and loam from 29 to 48 inches. These soils are well-drained and have a slope of 0 to 2 percent. Minor components of this mapping unit include Talmage, Russian, and Riverwash.

The Xerochrepts complex is not hydric and typically found on terraces, as is the case at the project site. The parent material is alluvium. The complex is well-drained, with a slope of 9 to 30 percent. The typical profile is gravelly loam from 0 to 12 inches, very gravelly loam from 12 to 36 inches, and gravelly sandy clay loam from 36 to 72 inches. Minor components of this complex include Redvine and Feliz.

RESULTS

A total of 0.46 acre of Waters of the U.S. was delineated within the boundaries of the Study Area (Figure 4). No wetlands were observed within or adjacent to the project site. Datasheets are included as Appendix B. Representative photographs of the Study Area are included in Appendix C.

Low-Flow Channel

The Low-Flow Channel of Mill Creek was characterized by an average sediment texture of very coarse sand. The total vegetation cover was 5% and composed of late succession trees and shrubs hanging over the Low-Flow Channel from the creek bank. Dominant species present were Gooding's black willow (*Salix gooddingii*; FACW), California ash (*Fraxinus dipetala*; NL), and white alder (*Alnus rhombifolia*; FACW). No vegetation was growing from within the channel. At the time of the site visit, water flow was not continuous (Mill Creek does not appear to have a ground water source). The remaining water took the form of separated pools, set in depressions in the creek bed, allowing for water to pool.

Characteristics used to delineate the boundary between the Low-Flow Channel and the Active Floodplain were:

- a slight increase in total vegetation cover,
- the appearance of seedlings and other early succession vegetation,
- the appearance of an herb stratum, and
- small benches, or changes in elevation, between the two channel features.

Active Floodplain

The Active Floodplain had a larger average sediment texture than the Low-Flow Channel and was characterized by pebbles. The total vegetation cover was 12%, with equal cover from trees and herbs, with a smaller percentage of shrubs. The herbs were in early successional stage, whereas the trees and shrubs were in late succession. Dominant species were Gooding's black willow, turkey mullein (*Eremocarpus setigerus*; NL), rough cocklebur (*Xanthium strumarium*; FAC), and vinegarweed (*Trichostema lanceolatum*; FACU).

Characteristics used to delineate the boundary between the Active Floodplain and the Low Terrace were:

- a distinct change in average sediment texture,
- a significant increase in total vegetation cover,
- a lack of vegetation in early successional stages,
- a change in dominant vegetation species present,
- the presence of drift and debris, and
- the presence of a well-defined bank.

This boundary is the location of the OHWM. The average width of the creek between OHWMs in the Study Area is approximately 76 feet.

Low Terrace
The Low Terrace had a marked change in sediment texture from the Active Floodplain. The sediment in the Low Terrace was fine silt. The total vegetation cover was 90%, which is much higher than in the other strata because the Low Terrace was located completely in the riparian area of Mill Creek, away from the usual flow of water. Dominant species included mule fat (*Baccharis salicifolia;* FACW), Gooding's black willow, Himalayan blackberry (*Rubus armeniacus*; FACU), and California ash—all in a late successional stage.

The boundary between the Low Terrace and upland were also estimated in the field based on a change in species composition of the surrounding vegetation and the definition of the upper bank, upon which Hill Road sits. Location details for this boundary are supplementary, are not necessary for OHWM mapping, and are not called for on the data sheets. However, it is shown on Figure 4 for perspective.

CONCLUSION

The lateral boundaries of ACOE jurisdictional waters were delineated in the Hill Road Bridge at Mill Creek Bridge Replacement project area. The OHWM of Mill Creek was determined by delineating the boundary between the Active Floodplain and the Low Terrace, per the guidelines in *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Lichvar *et. al* 2008). The 1.28-acre Study Area contains 0.46 acre of jurisdictional waters.

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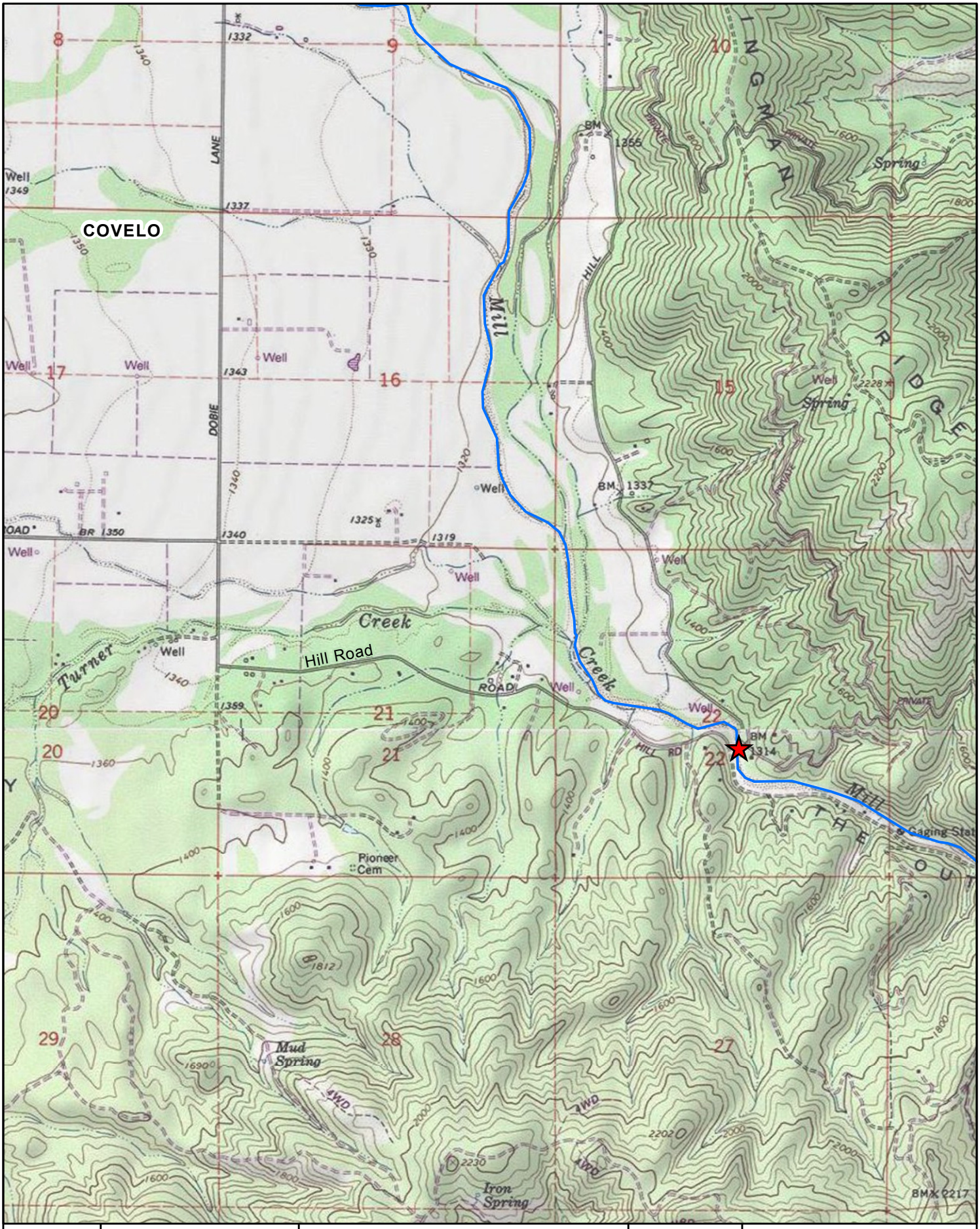
Reed, P.B., Jr. 1988. National List of Plant Species That Occur in Wetlands: National Summary. U.S. Fish Hildl. Serv. Biol. Rep. 88(24). 244 pp.

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Figure 2. Project Vicinity Map
Hill Road Bridge at Mill Creek
Bridge Replacement Project

Mendocino County, CA
November 2012



Study Area

0 1,000 2,000 3,000 4,000 Feet

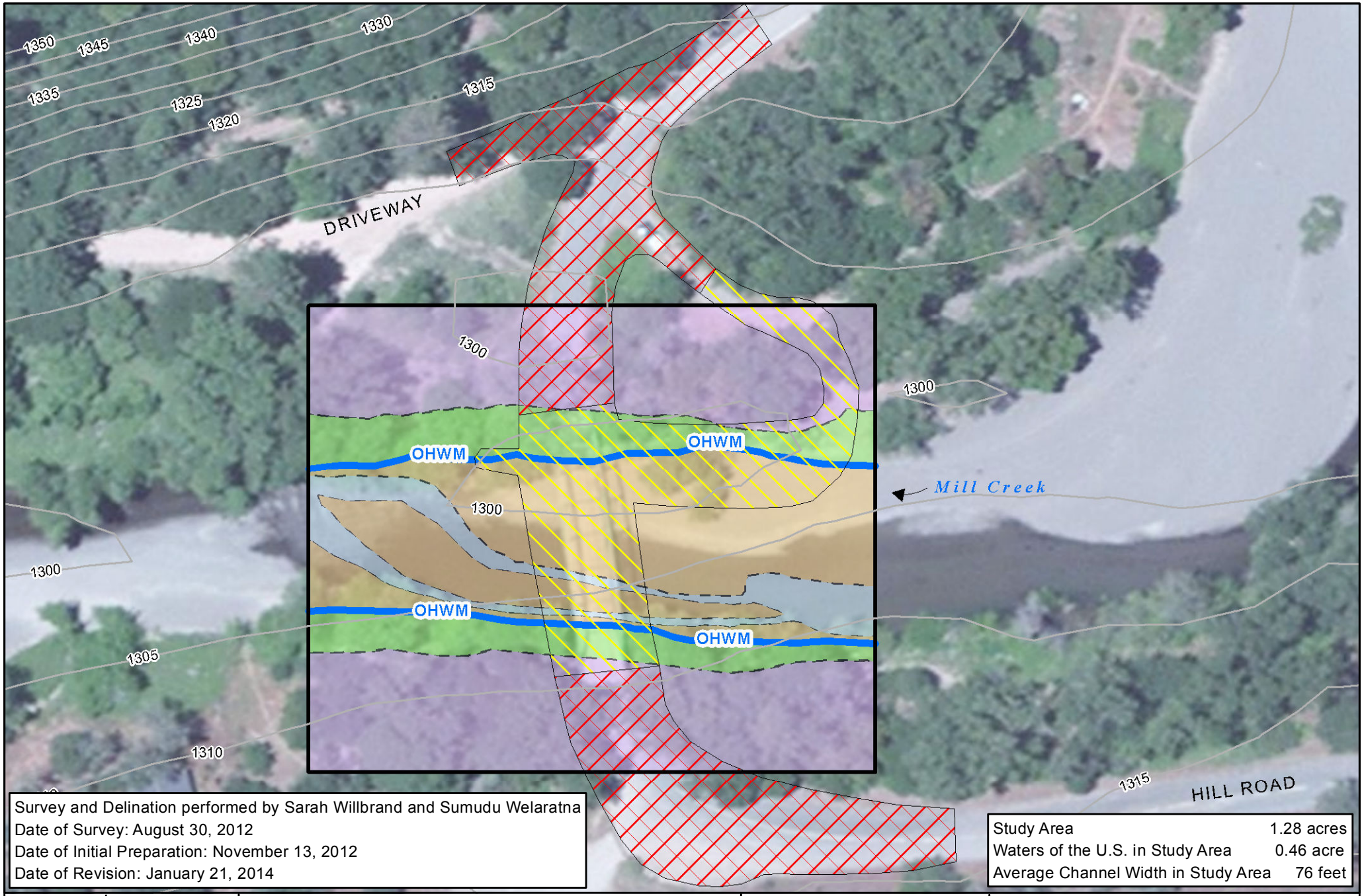
USGS 7.5' Quad: JAMISON RIDGE
Legal Description: T22N, R12W, S22

N

1:24,000
1 in = 2,000 ft

Figure 3. Project Location Topo
Hill Road Bridge at Mill Creek
Bridge Replacement Project

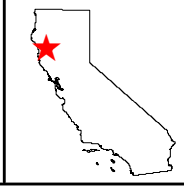
Mendocino County, CA
November 2012



Survey and Delination performed by Sarah Willbrand and Sumudu Welaratna
Date of Survey: August 30, 2012
Date of Initial Preparation: November 13, 2012
Date of Revision: January 21, 2014

Study Area	1.28 acres
Waters of the U.S. in Study Area	0.46 acre
Average Channel Width in Study Area	76 feet

GANDA



- Area of Permanent Impact
- Area of Temporary Impact
- Study Area
- Ordinary High Water Mark (OHWM)
- Contour (Ft)
- Low Flow Channel
- Active Floodplain
- Low Terrace
- Upland

0 25 50 Feet

N

Figure 4. Waters of the U.S in the Study Area
Hill Road Bridge at Mill Creek
Bridge Replacement Project

Mendocino County, CA
January 2014

Appendix F – NRCS Soils Report

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Mendocino County, Eastern Part and Southwestern Part of Trinity County, California

Mill Creek Bridge Replacement Project



June 29, 2012

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://soils.usda.gov/sqi/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://soils.usda.gov/contact/state_offices/).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Soil Data Mart Web site or the NRCS Web Soil Survey. The Soil Data Mart is the data storage site for the official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means

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Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

Special Line Features
- Gully
- Short Steep Slope
- Other

Political Features
- Cities

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:4,240 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 10N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Mendocino County, Eastern Part and Southwestern Part of Trinity County, California
Survey Area Data: Version 8, Jan 13, 2012

Date(s) aerial images were photographed: 6/14/2005

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Mendocino County, Eastern Part and Southwestern Part of Trinity County, California (CA687)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
178	Pinole gravelly loam, 2 to 8 percent slopes	0.5	1.4%
215	Xerochrepts-Haploxeralfs-Argixerolls complex, 9 to 30 percent slopes	25.3	71.0%
217	Xerofluvents, 0 to 2 percent slopes	9.8	27.6%
Totals for Area of Interest		**35.6**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If

intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Mendocino County, Eastern Part and Southwestern Part of Trinity County, California

178—Pinole gravelly loam, 2 to 8 percent slopes

Map Unit Setting

Elevation: 500 to 1,500 feet
Mean annual precipitation: 37 inches
Mean annual air temperature: 57 degrees F
Frost-free period: 200 to 250 days

Map Unit Composition

Pinole and similar soils: 85 percent
Minor components: 15 percent

Description of Pinole

Setting

Landform: Terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sedimentary rock

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very high (about 15.8 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability (nonirrigated): 3e

Typical profile

0 to 10 inches: Gravelly loam
10 to 37 inches: Gravelly clay loam, clay loam
37 to 61 inches: Sandy clay loam, gravelly sandy clay loam

Minor Components

Yokayo

Percent of map unit: 5 percent
Landform: Terraces

Unnamed

Percent of map unit: 5 percent

Pinnobie

Percent of map unit: 5 percent

Landform: Terraces

215—Xerochrepts-Haploxeralfs-Argixerolls complex, 9 to 30 percent slopes

Map Unit Setting

Elevation: 600 to 2,600 feet
Mean annual precipitation: 50 inches
Mean annual air temperature: 54 to 57 degrees F
Frost-free period: 150 to 225 days

Map Unit Composition

Xerochrepts and similar soils: 35 percent
Haploxeralfs and similar soils: 30 percent
Argixerolls and similar soils: 25 percent
Minor components: 10 percent

Description of Xerochrepts

Setting

Landform: Terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Alluvium

Properties and qualities

Slope: 9 to 30 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 5.9 inches)

Interpretive groups

Land capability (nonirrigated): 4e

Typical profile

0 to 12 inches: Gravelly loam
12 to 36 inches: Very gravelly loam
36 to 72 inches: Gravelly sandy clay loam

Description of Haploxeralfs

Setting

Landform: Terraces
Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Alluvium

Properties and qualities

Slope: 9 to 30 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 8.0 inches)

Interpretive groups

Land capability (nonirrigated): 4e

Typical profile

0 to 3 inches: Sandy loam
3 to 30 inches: Loam
30 to 37 inches: Gravelly sandy loam
37 to 60 inches: Very gravelly sandy loam, extremely gravelly sandy loam

Description of Argixerolls

Setting

Landform: Terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Alluvium

Properties and qualities

Slope: 9 to 30 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 10.3 inches)

Interpretive groups

Land capability (nonirrigated): 4e

Typical profile

0 to 11 inches: Loam
11 to 22 inches: Clay loam, gravelly clay loam
22 to 37 inches: Gravelly clay loam
37 to 60 inches: Clay

Minor Components

Redvine
Percent of map unit: 2 percent

Feliz
Percent of map unit: 2 percent

Gielow
Percent of map unit: 2 percent

Talmage
Percent of map unit: 2 percent

Yorkville
Percent of map unit: 2 percent

217—Xerofluvents, 0 to 2 percent slopes

Map Unit Setting
Elevation: 400 to 1,500 feet
Mean annual precipitation: 40 inches
Mean annual air temperature: 57 degrees F
Frost-free period: 175 to 250 days

Map Unit Composition
Xerofluvents and similar soils: 85 percent
Minor components: 15 percent

Description of Xerofluvents

Setting
Landform: Flood plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sedimentary rock

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Available water capacity: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability (nonirrigated): 3w

Typical profile

0 to 15 inches: Sandy loam
15 to 29 inches: Sand
29 to 48 inches: Loam
48 to 60 inches: Sand, gravelly sand

Minor Components

Talmage

Percent of map unit: 5 percent

Russian

Percent of map unit: 5 percent

Riverwash

Percent of map unit: 5 percent
Landform: Channels

Appendix G – Biological Assessment

Hill Road Bridge at Mill Creek Bridge Replacement Project



Biological Assessment

Hill Road Bridge at Mill Creek, Mendocino County
Bridge No. 10C0111
01-MEN-236-C.R. 327B-PM 2.05

Federal Aid Project Number: BRLO5910(084)
FWS File Number: 08EACT00-2018-E-00042

February 2020

Caltrans
CALIFORNIA DEPARTMENT OF TRANSPORTATION

Biological Assessment

Hill Road Bridge at Mill Creek, Mendocino County
Bridge No. 10C0111
01-MEN-236-C.R. 327B-PM 2.05

Federal Aid Project Number: BRLO5910(084)
FWS File Number: 08EACT00-2018-E-00042

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For individuals with sensory disabilities, this document can be made available in Braille, in large print, on audiocassette, or on computer disk. To obtain a copy in one of these alternate formats, please call or write to Department of Transportation, Attn: Brandon Larsen, Senior Environmental Planner, Caltrans District 1, P.O. Box 3700, Eureka, CA 95502; (707) 441-4548 (Voice), or use the California Relay Service 1 (800) 735-2929 (TTY) or 1 (800) 735-2922 (Voice).

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Acronym List

BMPs	Best Management Practices
Caltrans	California Department of Transportation
CDFW	California Department of Fish and Wildlife
CFR	Code of Federal Regulations
CNDDB/BIOS	California Natural Diversity Database/Biogeographic Information and Observation System
CNPS	California Native Plant Society
CWHR	California Wildlife Habitat Relationships
DBH	diameter at breast height
DPS	Distinct Population Segment
EFH	Essential Fish Habitat
ESU	Evolutionarily Significant Unit
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FMP	Fisheries Management Plan
GANDA	Garcia and Associates
Km	kilometers
LWD	Large Woody Debris
McDOT	Mendocino County Department of Transportation
mi	miles
MSFCMA	Magnuson Stevens Fishery Conservation and Management Act
NMFS	National Marine Fisheries Service
NRCS	Natural Resources Conservation Service
OHWM	ordinary high water mark
PFMC	Pacific Fisheries Management Council
RSP	rock slope protection
RWQCB	Regional Water Quality Control Board
SEL	sound exposure level
USACE	U.S. Army Corps of Engineers
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

Biological Assessment for Caltrans FESA Section 7 Consultations:

National Marine Fisheries Service and

U.S. Fish and Wildlife Service

Executive Summary

The purpose of this Biological Assessment is to provide technical information and to review the proposed project in sufficient detail to determine to what extent the proposed actions may affect threatened, endangered, or proposed species. The California Department of Transportation (Caltrans), as assigned by the Federal Highway Administration (FHWA), has prepared this Biological Assessment under its assumption of responsibility at 23 United States Code (USC) 327(a)(2)(A). The Biological Assessment is also prepared in accordance with the Code of Federal Regulations (CFR) at 50 CFR 402, legal requirements found in Section 7 (a)(2) of the Endangered Species Act (16 USC 1536(c)), and with FHWA and Caltrans regulation, policy, and guidance. The document presents technical information upon which later decisions regarding project effects are developed. The proposed project is the replacement of the structurally deficient Hill Road bridge over Mill Creek in Mendocino County, California. For most species evaluated, there would be no effect. Two species are evaluated in greater detail: the proposed project may affect and is likely to adversely affect Steelhead, Northern California (NC) Distinct Population Segment (DPS). The proposed project may affect, but is not likely to adversely affect Chinook Salmon, California Coastal (CC) Evolutionarily Significant Unit (ESU). For three salmonids (Coho Salmon, Chinook Salmon, and Steelhead) critical habitat has been designated in the Action Area and the proposed project is not likely to adversely modify designated critical habitat or Essential Fish Habitat (EFH). The finding for Steelhead requires formal consultation with National Marine Fisheries Service.

Chapter 1. Introduction

1.1. Purpose and Need of the Proposed Action

Hill Road Bridge, number 10C0111, on Hill Road spans Mill Creek in northeastern unincorporated Mendocino County. Hill Road is the primary east-west route in the region that serves as an important linkage to and from the southern portion of the City of Covelo and the southeastern region of Round Valley. The existing bridge has been determined by Caltrans to be structurally deficient. The Mendocino County Department of Transportation (McDOT) is proposing to replace the existing single-lane bridge with a new two-lane bridge and to widen roadway approaches.

1.2. Threatened, Endangered, Proposed Threatened or Proposed Endangered Species, Critical Habitat

Species lists were provided by the U.S. Fish and Wildlife Service (USFWS), the National Oceanic and Atmospheric Administration (NOAA) Fisheries, the California Native Plant Society (CNPS) and the California Department of Fish and Wildlife (CDFW) for the Action Area of this project and updated via database searches in November 2019 (see Appendix A). The following listed and proposed species and/or designated critical habitats were identified on the federal species lists and were considered during this analysis:

- Marbled Murrelet (*Brachyramphus marmoratus*), Federally Threatened (FT)
- Northern Spotted Owl (*Strix occidentalis caurina*), FT
- Western Snowy Plover (*Charadrius nivosus nivosus*), FT
- Western Yellow-billed Cuckoo (*Coccyzus americanus occidentalis*), FT
- California Red-legged Frog (*Rana draytonii*), FT
- Tidewater Goby (*Eucyclogobius newberryi*), Federally Endangered (FE)
- Burke's goldfields (*Lasthenia burkei*), FE
- Contra Costa goldfields (*Lasthenia conjugens*), FE
- showy Indian clover (*Trifolium amoenum*), FE
- water howelia (*Howellia aquatilis*), FT
- two-fork clover (*Trifolium amoenum*), FE
- Coho Salmon (*Oncorhynchus kisutch*)
    - Southern Oregon/Northern California ESU, FE
- Chinook Salmon (*Oncorhynchus tshawytscha*) critical habitat
    - California coastal ESU, FT
- Steelhead (*Oncorhynchus mykiss irideus*) critical habitat
    - Northern California DPS, FT

Table 1: Listed Species and Critical Habitat Determination

Common Name	Scientific Name	Federal Status	Determination
MAMMAL			
Fisher	*Pekania pennanti*	FC	No Effect. This species may occur in surrounding montane conifer forest, however there is no suitable mature forest with structural habitat features such as snags and large down woody debris in the Action Area. There are no known recent records in the immediate project vicinity, and the proposed activities associated with a bridge and stream crossing would not be expected to affect a mobile mammalian carnivore associated with upland forested habitat.
BIRDS			
Marbled Murrelet	*Brachyramphus marmoratus*	FT/SE	No Effect. The Action Area does not contain old growth coniferous forest or redwood habitats preferred by the Marbled Murrelet for nesting. Furthermore, the Action Area (see Section 1.4.4) is approximately 56 km (34.8 mi) from the coast where this species most commonly occurs. The nearest CNDDB/BIOS occurrence record for this species is about 39 km (24.2 mi) west of the Action Area and dated 1995.
Northern Spotted Owl	*Strix occidentalis caurina*	FT/ST	No Effect. The Action Area lacks large, old growth forest preferred by this species for nesting and surrounding woodland is oak rather than conifer dominated. Review of USFWS (2006) disturbance guidance suggests that noise impacts would not extend more than 400 meters beyond bridge, and there would be no construction at night. Critical habitat has been designated on National Forest lands surrounding Round Valley but does not include the Action Area. The nearest CNDDB/BIOS occurrence record for this species is 15 km (9.3 mi) northeast of the Action Area and dated 1995.

Western Snowy Plover	*Charadrius nivosus nivosus*	FT	No Effect. The Action Area does not include suitable beach/foredune habitats typically preferred by this species for nesting. Additionally, the nearest CNDDB/BIOS occurrence record for this speciesis about 59 km (36.7 mi) southwest of the Action Area and dated 1978.
Western Yellow-Billed cuckoo	*Coccyzus americanus occidentalis*	FT	No Effect. The Action Area lacks extensive dense riparian habitat preferred by this species for nesting, and there are no recent documented records from Mendocino County The nearest CNDDB/BIOS occurrence records for this species are about 87 km (54.1 mi) south from the Action Area near Clear Lake and 97 km (60.3 mi) east from the Action Area along the Sacramento River.
AMPHIBIANS			
California Red-legged Frog	*Rana draytonii*	FT	No Effect. The Action Area lacks suitable fishless permanent or semi-permanent ponds required by this species for breeding. Additionally, the Action Area is located at the periphery of the known range for California Red-legged Frog. The nearest CNDDB/BIOS occurrence record for this species is about 61 km (37.9 mi) northeast of the Action Area and dated 1986, and most recent records are in and south of southernmost coastal Mendocino County. There is no designated critical habitat near the Action Area.
PLANTS			
Burke's goldfields	*Lasthenia burkei*	FE	No Effect. There areno meadow, seep, or vernal pool habitats within the Action Area. There are also no CNDDB/BIOS records within Mendocino County for this species. Based on the absence of typical habitat and known occurrences, Burke's goldfields is not expected to occur in the Action Area.
Contra Costa goldfields	*Lasthenia conjugens*	FE	No Effect. There are no meadow, seep, or vernal pool habitats within the Action Area. An extirpated occurrence in Mendocino County represented the historic northern extent of this species' range. However, the current northernmost presumed extant occurrence of Contra Costa goldfields is in Napa

			County (USFWS 2013). Additionally, there are no CNDDB/BIOS occurrence records for this species within five miles of the proposed project and there is no vernal pool habitat within the Action Area. Therefore, Contra Costa goldfields is not expected to occur in the Action Area.
showy Indian (two-fork) clover	*Trifolium amoenum*	FE	No Effect. This species is not known to occur in Mendocino County and there are no CNDDB/BIOS occurrence records within five miles of the Action Area. Additionally, there are no coastal bluff scrub or open valley and foothill grassland habitats within the Action Area. Therefore, based on the absence of typical habitat and known occurrences, showy Indian clover is not expected to occur in the Action Area.
water howelia	*Howellia aquatilis*	FT	No Effect. No habitat for this species is present within the Action Area and there are no records of this species from the Action Area.
two-fork clover	*Trifolium amoenum*	FE	No Effect. No habitat for this species is present within the Action Area and there are no records of this species from the Action Area.
FISH SPECIES			
Chinook Salmon, California coastal ESU	*Oncorhynchus tshawytscha*	FT	May Affect, Not Likely to Adversely Affect. Mill Creek is a tributary of the Middle Fork Eel River, which supports spawning salmon. Chinook Salmon were historically present in Mill Creek but reportedly have not been observed since 1988 and late summer temperatures may exceed the critical thermal maximum. Presence in the Action Area is unlikely in late summer, but the species is retained because of presence in the Eel downstream of the project. Mill Creek includes designated critical habitat for Chinook.
Coho Salmon, Southern Oregon-northern California Coast (SONCC) DPS	*Oncorhynchus kisutch*	FT, ST	No Effect. Coho Salmon are believed to be extirpated in the Middle Fork Eel drainage and thus are not expected to be present within or near the Action Area. Mill Creek is however within designated critical habitat for SONCC Coho Salmon.

Steelhead,northern California DPS	*Oncorhynchus mykiss irideus*	FT	May Affect, Likely to Adversely Affect. There are 1996 records of juvenile Steelhead in lower Mill Creek and there are also reports from the upper waterhed. Mill Creek is a tributary of the Middle Fork Eel River, which supports spawning Steelhead. Although work would occur during periods of no flow, Steelhead could be present in remnant pools and relocation may be necessary. Mill Creek within the Action Area includes designated critical habitat for Steelhead.
Tidewater Goby	*Eucyclogobius newberryi*	FE	No Effect. No habitat for this species is present within the Action Area and there are no records of this species from the Action Area.

Status: Distinct Population Segment (DPS); Evolutionarily Significant Unit (ESU); Federal Endangered (FE); Federal Threatened (FT)

Determination: California Natural Diversity Database/Biogeographic Information and Observation System (CNDDB/BIOS); kilometer (km); mile (mi); Not Likely to Adversely Affect (NLAA)

Candidate Species

The Fisher (*Pekania pennanti*) is currently proposed for federal threatened status. There would be no effect on Fisher; the species may occur in surrounding montane conifer forest, however there is no suitable mature forest with structural habitat features such as snags and large down woody debris in the Action Area. There are no known recent records in the immediate project vicinity, and the proposed activities associated with a bridge and stream crossing would not be expected to affect a mobile mammalian carnivore associated with upland habitat. There are no other known federal candidate species that may be affected by the proposed action.

Critical Habitat

The proposed action addressed within this document falls within critical habitat for Chinook Salmon, Coho Salmon, and Steelhead.

1.3. Consultation History

McDOT has been consulting with Caltrans/FHWA regarding the proposed action since 2008. An updated list of threatened and endangered species that may occur in the Action Area, and/or may be affected by the proposed project was received from USFWS on October 19, 2017 and updated on October 4, 2019 and on November 13, 2019. An updated list of anadromous fish was obtained from National Marine Fisheries Service (NMFS) on January 19, 2018 and updated on November 13, 2019 (Appendix A). Lists from CNPS and CNDDB were obtained on May 5, 2016 and updated on November 13, 2019 (Appendix A). No other consultation has taken place to date.

Preparation of the Biological Assessment (BA) began by Garcia and Associates (GANDA) in late 2012 with review of ongoing versions during 2013, 2014, and 2015. GHD biologists updated a final

draft version in January 2018 (Jessica Nadolski, GHD Roseville), March 2019, October 2019, and November 2019 (Ken Mierzwa, GHD Eureka).

1.4. Description of Proposed Action

The proposed action is to replace an existing bridge over Mill Creek that has been determined to be structurally deficient. The following sections provide a detailed description of proposed activities related to the preferred project alternative.

1.4.1. Project Summary

The proposed project would replace an existing single-lane bridge with a new two-lane bridge and widen the existing roadway approaches. The new bridge would be approximately 44.2 meters (145 feet) long and 7.9 meters (26 feet) wide, which would be 7.6 meters (25 feet) longer and 2.4 meters (8 feet) wider than the existing bridge. The horizontal alignment of the new bridge would match that of the existing bridge, which is approximately perpendicular to the normal stream alignment of Mill Creek. The new bridge would be similar in character to the existing bridge, namely a single-span, steel truss structure. In addition to the new bridge, approximately 61 meters (200 feet) sections of the roadway on either side of the bridge would be improved with two 2.7 meters (9 feet) wide travel lanes and 0.6 meter (2 feet) wide shoulders to accommodate the new bridge deck elevation, width, and location. The new bridge will be located in the same footprint as the existing bridge; therefore, the approaches will remain in the same place, reducing total impacts to the site.

Construction, including road widening and tree trimming, is anticipated to take place from March to November 2024. Various pre-construction surveys and avoidance measures may be conducted/implemented prior to the planned construction season, such as installation of bat roosting avoidance. Construction activities within the banks of Mill Creek will be performed between June 15 and October 15, but only when there is little or no stream flow. The existing bridge crossing will be closed to vehicles and detours will route traffic around the crossing while the existing bridge is dismantled and the new bridge constructed. Traffic would be routed around the Project site utilizing alternate roadways in the area. No temporary crossing is proposed. Temporary staging would occur within the roadway on either side of the creek and would be used for delivery and storage of construction materials, for fueling and maintenance of equipment, and for contractor parking (Figure 3).

If water is present in the channel between June and October, the flow will be diverted by either placing sandbags, installing two sets of k-rails and a rubber lining, installing super sacks, or installing sheetpiles along the construction area to allow low flow to continue through the construction area. Depending on the amount of flow present the contractor shall implement one of the above-listed diversion tactics. If flow is shallow, sand bags can be placed along the construction area. If there is a greater amount of flow present either the k-rail, super sack, or sheetpile option could be implemented. If there is no flow during the construction period (typical of late summer/early fall most years), diversion may be unnecessary or optional.

Under implementation of the k-rail diversion technique, the channel bottom would need to be excavated so the rubber lining lies flat along the bottom of the channel. Then two rows of k-rails will be installed parallel to the creek banks to hold the lining in place and keep the flow away from the

construction activities. Under implementation of the super sacks, some excavation would also need to occur to place a plastic lining, and then two large sacks filled with rock would be positioned along each creek bank. For both the k-rail and super sack dewatering options some gravel would be placed on the lining to provide habitat for amphibians as well as passage for fish species. Under implementation of the sheetpile diversion method, temporary sheetpiles will be advanced or pushed into the sediments using non-vibratory methods along both creek banks.

If flow is present and dewatering is required, block nets would first be placed at each end and qualified biologists would capture and relocate any native fish or other native aquatic species present in the reach to be dewatered. Once dewatering is implemented and flow is diverted away from the construction area, a biologist would be present and any standing water would be observed for fish. All fish located within the construction area immediately prior to or during dewatering will be captured by seine, dip net, and/or electrofisher and removed by qualified biologists pre-approved by NMFS. The fish will be placed in an aerated cooler or 5-gallon bucket of water from the habitat they were captured in and then be relocated within 30 minutes of capture to suitable habitat within the action area, but outside the immediate project footprint. Fish relocation will occur during the work window and is only anticipated to occur for one construction season, only if flow or remnant pools are present, and be conducted by qualified fisheries biologists. A relocation plan would be prepared and submitted to NMFS for approval at least two weeks prior to the start of construction.

If a remnant pool is present in the work area with no flow and no connection to other standing water, methods would be as immediately above except with no diversion. Biologists would stand by during dewatering to relocate native aquatic organisms.

If it is determined during final design that a diversion method would result in additional impacts not fully analyzed in this biological assessment (pile driving which extends noise/vibration impacts, grading of the channel which could result in adverse effects to ESA-listed species) then that method would not be utilized.

Construction equipment, including cranes, excavators, jack hammers, and shovels, will be used to remove the existing bridge deck, truss, concrete abutments, headwalls, and associated footings from the creek. Existing concrete abutments located outside of the creek channel will be cut below grade and left in place. Demolition waste will be stockpiled and sorted beyond the banks of the creek.

New abutments will be placed behind the existing abutments and further up the bank from the creek channel. This would effectively widen the opening at the bridge by approximately 3.1 meters (10 feet) on the east bank and 6.1 meters (20 feet) on the west bank. The foundation for the new abutments will be steel pipe piles that will require pile driving for installation. This foundation solution has been selected as the most reliable to survive the potential liquefaction issues in the soils on the west side of the creek. The piles will be installed from the new approaches and outside the low-flow channel through silty gravels under the eastern abutment and through silty gravels, silty sand, and clay under the western abutment. The eastern abutment will be constructed on two rows of eleven piles placed at 4-foot intervals. The western abutment will be constructed on two rows one comprised of 16 piles and the other comprised of 17 of piles. The two rows will be 4 feet apart and the piles in each row spaced at 4-foot intervals. The steel pipe piles are estimated to be approximately 30 feet in length, 16 inches in diameter, and weigh 83 pounds per foot. Piles at each new bridge support will be placed below the scour line of the streambed of Mill Creek to a depth of

up to 9.1 meters (30 feet). The number of piles to be installed (and hammer strikes) per day will be determined by the contractor. A summary of pile data for the proposed project is found in Table 2 below.

All pile driving will be limited to channel banks (e.g., no pile driving will occur in the wetted portion of the channel). No in-water pile driving would be required to complete the proposed project, therefore, underwater noise impacts to fish are not expected.

Table 2: Pile Driving for the Hill Road Bridge at Mill Creek Replacement Project

Structure	Driver Type	Pile Type	Pile Size		Maximum Number of Piles	Piles Installed Each Day/ Strikes per Day
			Diameter	Length		
Bridge Abutment Pile	Impact	Steel Pipe	16 inches	30 feet	55 (22 eastern; 33 western)	To be determined

A temporary access road would be constructed along the gravel bar along the western side of the wetted portion of the channel to accommodate limited as-needed construction activities, such as the installation of scour protection for the abutments. RSP along the eastern bank would be placed from top of bank prior to installation of the bridge. A crane will be used to set the new prefabricated steel structure in place.

Creek banks will be re-contoured to match the existing bank slopes, or to a maximum 2:1 slope, where existing abutments are removed. After obtaining the engineered grade of the channel banks, rock slope protection (RSP) would be placed to armor and protect the banks from potential erosion. There would be a permanent placement of 3,700 square feet of RSP: approximately 2,600 square feet (90 linear feet) of RSP on the east bank and approximately 3,100 square feet (95 linear feet) on the west bank. Once the new bridge and RSP is complete, the construction area, including any exposed and disturbed areas of the creek bank, will be seeded and mulched. Native plants including locally sourced willow cuttings will be used for re-vegetation.

The total construction disturbance area is estimated to be 0.36 hectares (0.9 acre). Permanent impacts from the proposed project are anticipated to be limited to the areas of expansion on the roadway approaches, areas along the creek where the new abutments will be placed, and the slightly widened bridge footprint. The proposed project does not include permanent impacts to Mill Creek. Temporary impacts are anticipated to be limited to the areas used for construction access into the creek channel as well as areas under and immediately surrounding the bridge.

1.4.2. Authorities and Discretion

The project is being proposed and implemented at the discretion of McDOT with Caltrans approval under FHWA authority.

The information presented in the Biological Assessment is intended to comply with statutory requirements to use the best scientific knowledge and commercial information available to assess risks posed to listed and/or proposed species and designated and/or proposed critical habitat from

planned federal actions. This document has been prepared in accordance with legal requirements set forth under regulations implementing Section 7 of the Federal Endangered Species Act (FESA) through consultation with USFWS and National Oceanic and Atmospheric Administration National Marine Fisheries Service (NMFS).

In addition to USFWS and NMFS authority under FESA, the proposed project will be regulated by: a) the California North Coast Regional Water Quality Control Board (RWQCB) under Section 401 of the Clean Water Act, and b) the California Department of Fish and Wildlife (CDFW) under Section 1602 of the California Fish and Game Code.

1.4.3. Project Location

The proposed project includes Hill Road Bridge, number 10C0111, that spans Mill Creek and portions of Hill Road situated southeast of Covelo in northeastern unincorporated Mendocino County. The project location is approximately 2.4 kilometers (1.5 miles) east of the intersection of Hill Road and Dobie Lane, at mile post 2.05. Hill Road is designated as a rural connector, county road327B. The Project is shown on the Jamison Ridge 7.5-minute United States Geological Survey (USGS) quadrangle at township 22 north, range 12 west, and section 22. The approximate coordinates of the proposed Project are latitude 39.7491 north and longitude -123.1814 west. Project maps are included as Appendix B.

1.4.4. Define Action Area

The area of direct disturbance is estimated to be 0.36 hectares (0.9 acre). This includes areas proposed to be permanently and temporary impacted by construction activities. The Action Area is defined to include the area of direct disturbance as well as the maximum surrounding areas that could be indirectly impacted during construction. This includes areas that could be affected by noise or fugitive dust during construction and areas that would be shaded by new structures. The Action Area (or biological study area) is presented on Figure 4 of Appendix B.

1.4.5. Project Design Modifications for Avoidance and Minimization

Four alternatives were considered during project development to replace the single-lane bridge with a two-lane bridge. Alternative Four is the selected alternative as this alternative avoids and minimizes effects to biological resources.

<u>The Selected Alternative: Single-Span Weathering Steel Truss Bridge</u>

The selected alternative provides a steel truss bridge made of weathering steel, a special alloy that is designed to form an exterior rust barrier, providing a low-maintenance surface that does not require cleaning or painting. This bridge will be prefabricated in modular sections, transported to the site, assembled on-site, and lifted into place using mobile cranes. The elevation view of the bridge will closely match the general shape of the existing bridge, a steel truss with a straight bottom chord, and a bowed upper chord. The ends of bridge will be supported on cast-in-place concrete abutments. No temporary supports will be required within the waterway.

This alternative provides less environmental impacts by offering a single span solution, while keeping the bridge deck fairly thin and maintaining the low elevation of Hill Road to avoid sudden vertical changes where the bridge and road meet.

The project has been designed to avoid and minimize impacts to Mill Creek and the surrounding habitat by proposing to build the replacement bridge in the same footprint as the existing bridge and by not placing any permanent bridge structures in the creek channel. In addition, construction activities within the creek are proposed to occur only during no or low flows during summer months to avoid impacts to listed fish species.

1.4.6. Species Specific Avoidance/Minimization Measures or BMPs from the USFWS/NOAA Fisheries BA Checklists

The proposed project may affect, and is likely to adversely affect, steelhead within Mill Creek. The proposed project may affect, but is not likely to adversely affect Chinook Salmon. Direct effects within the creek would be minimized by limiting the construction timeframe to summer and early fall when there are no or low flows and by avoiding any permanent modification of the low flow channel. If Steelhead are present they would be translocated as described in Section 5.5. Indirect effects would be minimized by implementation of a Stormwater Pollution Prevention Plan (SWPPP)and Spill Prevention Control and Countermeasures Plan (SPPC). Additional measures required by the North Coast RWQCB and CDFW would also be implemented to maintain water quality within Mill Creek.

1.4.6. Interrelated and Interdependent Actions

There are no interrelated or interdependent actions related to the proposed Project.

Chapter 2. Study Methods

2.1. Summary

GANDA biologists conducted an initial desktop literature and database review as well as a reconnaissance level survey of the Action Area. GHD updated the literature review multiple times, most recently in late 2019. A list was generated of the species that are listed as endangered, threatened, or proposed for listing as endangered or threatened under the ESA, and of designated critical habitat that may occur in the Action Area (Table 1) from the following sources (database searches provided in Appendix A):

- Query for records within the nine-quad area centered on the Jamison Ridge, CA USGS 7.5-minute quadrangles from the California Department of Fish and Wildlife's California Natural Diversity (CNDDB) Database, Rarefind, on November 13, 2019 (CDFW 2019).
- Query for records within the nine-quad area centered on the Jamison Ridge, CA USGS 7.5-minute quadrangles from the California Native Plant Society's Database on November 13, 2019 (CNPS 2019).
- Query for records within the nine-quad area centered on the Jamison Ridge, CA USGS 7.5-minute quadrangles from IPaC Trust resource reports, November 13, 2019 (USFWS 2019).
- Query for records within the nine-quad area centered on the Jamison Ridge, CA USGS 7.5-minute quadrangles from NOAA Fisheries West Coast Region California Species List Tools, November 13, 2019 (NOAA Fisheries 2019).

Desktop scoping also included reviewing the National Wetland Inventory Maps (USFWS 2017), the Natural Resources Conservation Service (NRCS) Web Soil Survey (NRCS 2017); and current aerial imagery. In March 2019, GHD staff with prior field and Endangered Species Act experience in the Covelo/Round Valley area reviewed and updated the BA and addressed Caltrans comments.

2.2. Personnel and Survey Dates

A reconnaissance level field survey was performed by GANDA biologists, Sumudu Welaratna M.S., and Sarah Willbrand M.S. The survey was performed on August 30, 2012, and included walking the entire project site to document vegetation and habitat types. Special attention was paid to sensitive biological resources such as habitat for and indicators of special status species presence, and potential wetlands. Plants and wildlife seen during site visits were documented, using both photo-documentation and written notes. Additionally, a survey of Mill Creek was performed at the project site to delineate the Ordinary High Water Mark (OHWM) and lateral extent of the ephemeral/intermittent channel in accordance with U.S. Army Corps of Engineers (USACE) 2008 guidelines (Lichvar and McColley 2008). An additional reconnaissance level site visit was conducted on May 8, 2019 by Ken Mierzwa of GHD to assess habitat. Caltrans biologists also visited the site in August 2019.

The 2017 update of the BA was conducted by Jessica Nadolski of the GHD Roseville office. The March 2019 update of the BA was conducted by Ken Mierzwa and Genevieve Rozhon of the GHD

Eureka office; both have recent experience on other Covelo/Round Valley projects including a crossing of Mill Creek upstream of the present project area. The February 2020 update was also conducted by Ken Mierzwa.

2.3. Resource Agency Coordination and Professional Contacts

McDOT is coordinating with Caltrans/FHWA to review this project. A Preliminary Environmental Study Form was completed on May 30, 2008. A Natural Environment Study will also be completed for the proposed project.

An official species list pursuant to Section 7 of the FESA was received from the USFWS on October 19, 2017. A species list was received from NMFS on January 19, 2018 and update via a database search on November 13, 2019. The USFWS list was updated through an IPaC query on March 8, 2019 and November 13, 2019.

2.4. Limitations and Assumptions that May Influence Results

The reconnaissance level site survey was conducted in August 2012 to assess habitat for the potential to support federally listed species. Mill Creek had no stream flow within the Action Area during the field survey. The survey was conducted outside of the blooming period for some special status plants. Protocol surveys for plants or wildlife have not been conducted. An inferred presence approach based on available habitat was being used for species determinations. Subsequent 2017 and 2019 updates by GHD did not include field visits to the project area, however the 2019 update was informed by past field work on Mill Creek near SR 162 (upstream of the project area) including multi-season observations of flow, recon-level wildlife and rare plant surveys, and associated literature review.

Chapter 3. Environmental Baseline

The Environmental Baseline describes the setting in which the project will occur and includes the effects from past and present federal, state, private actions; proposed federal projects with completed Section 7 consultations; and contemporaneous state or private actions with consultation in progress. The environmental baseline also considers non-permitted actions (i.e., other nonfederal actions occurring within the Action Area).

3.1. Habitat Conditions in the Action Area

Vegetation communities within the proposed limits of disturbance (and throughout the action area) are subjected to several anthropogenic-related disturbances. Hill Road, as a primary rural connector, conveys a moderate volume of vehicle traffic resulting in disturbances such as noise, lighting, wildlife collisions, and illegal dumping. The action area also includes previously disturbed lands in association with the existing bridge structure, supports, and road approaches.

Environmentally sensitive areas within the project limits consist of oak woodland and willow riparian habitats, and Mill Creek (Appendix B, Figure 5). The quantity of sensitive areas to be affected by the proposed project has been kept to a minimum by designing the new structure at the same location of the existing bridge and road.

3.2. Summary of Environmental Baseline

The Action Area is located in rural Mendocino County in the North Coast range of California (Appendix B, Figure 2). There are residential buildings and outbuildings both upstream and downstream from the Hill Road Bridge. The area surrounding the Action Area includes rural residential property and some agricultural uses in nearby Covelo. A substantial area of contiguous protected lands also occur in the surrounding areas, including: the Shasta Trinity National Forest and Six Rivers National Forest to the east, Yolla Bolly-Middle Eel Wilderness to the northwest, and Mendocino National Forest to the west and southwest.

The Action Area is located approximately 396 meters (1,300 feet) above sea level in an area with gentle slopes. The soils are comprised mainly of Xerochrepts-Haploxeralfs-Argixerolls complex (71%) and Xerofluvents (27.6%), both of which are derived from Alluvial material. A small area of Pinole gravelly loam (1.4%) is also included in the upstream portion of the Action Area (NRCS 2017).

Mill Creek is a tributary to the Middle Fork Eel River. The creek flows southeasterly, entering the Middle Fork Eel River about 33.47 stream kilometers (20.8 stream miles) upstream from the Eel River confluence (Becker and Reining 2009). The Eel River flows into the Pacific Ocean just south of Humboldt Bay in northern California (Appendix B, Figure 1). There are no dams blocking fish passage between the mouth of the Eel River and the Action Area. However, water is diverted into the Russian River upstream from the confluence of the Middle Fork Eel River with the mainstem Eel River. This diversion is part of the Potter Valley Project, which began in 1906 to divert water into the

Russian River to supply the more populous area to the south. Although this does not directly affect the Action Area, the result is decreased flows in the Eel River and increased flows in the Russian River. The diversion has contributed, in part, to reduced anadromous fish runs in the Eel River and its tributaries (NMFS 2012).

Mill Creek within the Action Area is often dry during the late summer months. The location has not received a detailed study from the Federal Emergency Management Agency for flood insurance purposes, but the watershed and flow has received significant study and analysis by USGS. The USGS stream gage No. 11473700 is located just downstream of the Action Area and acquired data from 1956 to 1971 as part of a USGS watershed investigation, "Magnitude and Frequency of Floods in California" (Waananen and Crippen 1977).The study, based on the USGS gage data, shows little or no flow during August, September, and October during the period from 1956 to 1971. The site survey confirmed no flow in August 2012. However, remnant isolated pools may remain, and at least in some years lower Mill Creek retains segments of contiguous wetted channel with little flow and relatively warm temperatures (CDFG 1997).

On August 29, 1996, the California Department of Fish and Wildlife (then the Dept. of Fish and Game) characterized a 6,902-foot long segment of Mill Creek from downstream of the Hill Road bridge to the confluence with the Middle Fork of the Eel (CDFG 1997). Flow at the mouth was 0.3 cfs. The channel was described as “entrenched, meandering, riffle/pool channels on low gradients with high width-depth ratios and gravel-dominated substrates.” Water temperatures ranged from 76 to 90 degrees F. On the day of the survey, 50% of the channel was dry, 26% consisted of pools, and 24% was flatwater. 42% of the 33 pools had a depth of > 2 feet. Of pool tail-outs measured, 82% had cobble embeddedness at the lowest quality ranking, suggesting that sediment has filled most interstitial spaces. The CDFG (1997) report suggested that limiting factors for salmonids included excessive late summer water temperatures, lack of riparian shading, little woody debris, excessive sediment input, and a lack of deep pools to provide cooler-water refugia.

3.3. Describe the Action Area

Two vegetation communities, *Quercus douglasii* Woodland Alliance and *Salix gooddingii* Woodland Alliance, were noted by GANDA within the Action Area in 2012. GHD updated the vegetation types based on desktop review of recent literature in 2017. The updated vegetation communities are described below. The classification of vegetation in the project limits is based on A Manual of California Vegetation 2nd Edition (Sawyer et al. 2009), which describes all major vegetation types known in California. The natural vegetation types, called “alliances”, are floristically defined by their dominant and/or characteristic species. In addition to the alliances discussed below, the action area includes Mill Creek as well as paved and graveled roadways.

Quercus douglasii Woodland Alliance – Blue Oak Woodland

The *Quercus douglasii* Woodland Alliance establishes in varied stands and forms one of the most extensive and conspicuous vegetation types in California. It is found in valley bottoms, foothills, and rocky outcrops, in areas where soils are shallow and low in fertility. Dominated or co-dominated by

blue oaks, the canopy ranges from intermittent to continuous with a sparse to intermittent shrub layer. Herbaceous layer is sparse or grassy and forbs are present seasonally (Sawyer et al. 2009).

Blue oak woodland is present along the perimeter of the project limits and the border of the action area situated furthest from Mill Creek.

Quercus lobata Woodland Alliance – Valley Oak Woodland

The *Quercus lobata* Woodland Alliance is found in riparian corridors and valley bottoms in intermittently saturated soils. This community is characterized by valley oaks dominating more than a third of the canopy cover often co-occurring with willows and other riparian species. Valley oaks are deciduous, have deeply lobed leaves, and grow to just under 114 feet tall. Round Valley actually hosts the tallest known living valley oak in the U.S. The California Wildlife Habitat Relationships (CWHR) system estimates more than thirty bird species and eighty mammal species utilize valley oak woodlands, many utilizing available acorns (CDFW 2017b; CNPS 2017; CTNR 2017). Valley oak woodland is the dominant oak woodland throughout the Action Area situated beyond the riparian corridor associated with the creek and along Hill Road.

Salix lasiolepis Shrubland Alliance – Arroyo Willow Thickets

Arroyo willow thickets occur throughout the State along intermittent and permanent stream edges and drainages in the Northern California Coast Ranges. The *Salix lasiolepis* Shrubland Alliance is adapted to withstand, but is often modified by, winter flooding. Arroyo willows can reach to more than 30 feet tall and form an open to continuous canopy over a variable herbaceous layer (CNPS 2017). The CWHR system classifies this habitat as valley foothill riparian, which is considered among some of the most productive habitat for wildlife in California (CDFW 2017). Arroyo willow thickets form a patchy riparian corridor along Mill Creek within the Action Area.

Aquatic Features

Mill Creek is a tributary to the Middle Fork Eel River, which flows to the Pacific Ocean just south of Humboldt Bay in northern California. Mill Creek in the Action Area is often dry or nearly dry during the late summer months. The creek is classified as an intermittent stream within the USGS National Hydrology Dataset.

Chapter 4. Federally-Listed/Proposed Species and Designated Critical Habitat within Action Area

4.1. Federally-Listed/Proposed Species

Table 1 shows the federally listed plants and animals that are known to occur or have potential to occur in the Action Area. Based on existing scientific literature, technical reports, and survey data collected for the proposed project, a determination of may affect, likely to adversely affect has been made for one species (Steelhead) and a finding of may affect, not likely to adversely affect has been made for one species (Chinook Salmon). These species are described below.

4.2. Discussion of Species

Fish Discussion

Chinook Salmon and Steelhead are the fish species considered further based on the determinations in Table 1. Coho Salmon are excluded because they are believed to be extirpated from the Middle Fork Eel drainage (Brown and Moyle 1991, Yoshiyama and Moyle 2010).

The California Coastal (CC) Chinook Salmon (*Oncorhynchus tshawytscha*) is designated as a federally threatened species. Chinook Salmon, also referred to as king salmon, are the largest of all the Pacific salmon species, reaching typical lengths of 0.8 meter (2.6 feet). They are anadromous, meaning they are born and reared in freshwater, migrate to the ocean to feed, and return to their natal streams to spawn and die (NMFS 2007, University of California 2012). Spawning Chinook Salmon typically choose streambeds with large gravel substrate that may be near deep pools, where they build a series of nests or redds. When young Chinook Salmon emerge as fry, they are usually swept down to areas of slower water velocities. Juveniles feed primarily on drifting insects of different sizes and stages (NMFS 2007, University of California 2012). Chinook Salmon then emigrate to the ocean where they remain for two to five years and have a primary diet of crustaceans and other fish, fueling rapid growth rates (NMFS 2007).

Although no known surveys have documented the presence of Chinook Salmon in Mill Creek, the species is known to occur in the Middle Fork Eel River drainage and it has been described as the “anchor for production of Chinook Salmon in the upper Eel River” (Bjorkstedt et al. 2005). Most of Mill Creek is categorized as having high intrinsic potential, meaning that the stream is thought to have historically provided good quality habitat (NMFS 2016). Today however, most habitat features are rated as poor (NMFS 2016). Seasonal drying and high summer water temperatures are believed to preclude presence of this species in the Action Area during the summer/early fall construction season, although it is possible that a few Chinook Salmon enter the area during cooler and higher flow times of year. However according to Morford (1995), members of the Covelo Native American community reported that Chinook Salmon had not been observed in the Round Valley area since about 1988.

The Northern California (NC) distinct population segment of Steelhead (*Oncorhynchus mykiss irideus*) is designated as federally threatened. This species has both an anadromous form, known as "Steelhead" and a resident form known as "Coastal Rainbow Trout." Both forms are found within the Eel River system with the rainbow trout occurring upstream of the Scott Dam, which is part of the Potter Valley Project (Becker and Reining 2009). Steelhead are usually lighter in color than resident Rainbow Trout (University of California 2012). Adults typically reach lengths of 0.35 to 0.65 meter (1.2 to 2.1 feet). Steelhead return to their natal streams to spawn with similar spawning requirements to those of the Chinook Salmon. The young often spend two years in freshwater before migrating to the ocean. Steelhead may stay in saltwater for one to two years before returning to their native streams. Most anadromous salmonids die after spawning but Steelhead may make numerous trips back and forth between fresh and salt water to breed. Steelhead may spawn up to four times per life span, though many do not survive between breeding cycles (University of California 2012).

Spring/summer run Steelhead occur in the Middle Fork of the Eel and tributaries (CDFG 1997, Yoshiyama and Moyle 2010). Numbers have declined considerably from historic levels, with a few hundred to about 1,600 adults counted each year between 1966 and 2002 (McEwan and Jackson 1996, NMFS 2005). The mean annual count during that interval in the Middle Fork system was 1,246 (NMFS 2005). Steelhead in tributaries within the Middle Fork basin show some genetic differentiation (Yoshiyama and Moyle 2010).

Surveys in 1996 documented the presence of seven YOY (young-of-the-year) and one age 1+ Steelhead in Mill Creek just over three miles upstream of the project's Action Area (CDFG 1997). The area sampled was 50 percent dry during the late August survey, with water temperatures ranging from 76-86° F, which the report defined as "very warm" for salmonids. NMFS (2016) mapped most of Mill Creek as having "moderate intrinsic potential" to support Steelhead. They defined moderate intrinsic potential as "the historical potential of stream segments to provide suitable habitat." Small areas in the headwaters and the lowermost segment of Mill Creek, well above and just below the Action Area, are considered to have high potential (NMFS 2016). We assume that Steelhead could potentially be present at certain times of year when water is present and within acceptable depth, flow, and temperature ranges.

Mill Creek is designated Critical Habitat for Chinook salmon (listed December 29, 1999) and steelhead (listed September 7, 2000; USFWS 2017a).

4.3. Survey Results

Fish Species

No Chinook Salmon were detected during the site survey and Mill Creek was dry. Salmon runs are difficult to estimate, but literature suggests that generally less than 1,000 wild adults are returning to the Eel River basin (Yoshiyama and Moyle 2010). As cited in Yoshiyama and Moyle (2010), members of the Covelo Native American Community reported that Chinook salmon have not been observed in the Middle Fork Eel River, Williams Creek, and/or Round Valley streams since about 1988. The research shows that this species is no longer likely to be found in Mill Creek. However, the most recent 2016 to 2017 fall run data reported by the Eel River Recovery Project indicate the species' numbers are rising and waves of spawning are now occurring in various locations in the

Middle Fork Eel River at Round Valley (Eel River Recovery Project 2017). Fall-run Chinook juveniles outmigrate to the ocean within their first year from April through July. If Chinook Salmon do spawn in either Mill Creek or Middle Fork Eel River, it is unlikely they would be present in the Action Area from August through October. August water temperatures near the Action Area have been documented to meet or exceed the critical thermal maximum (24°C/75°F) for Chinook Salmon (CDFG 1997).

In addition, no Steelhead were detected during the site survey, however young-of-year and age 1+ Steelhead have been reported both upstream and downstream of the Action Area in past surveys during late summer (1,857 and 35,376 feet above the mouth of Mill Creek, CDFG 1997). Continued presence in Mill Creek is assumed.

The field survey was conducted during August when there was no flow in Mill Creek within the Action Area. The survey yielded an observation of Sacramento Pikeminnow (*Ptychocheilus grandis*) in ponded water in the streambed approximately 10 meters (32.8 feet) north of the bridge. The Sacramento Pikeminnow is native to the California Central Valley and was introduced into the Eel River around 1980 (Yoshiyama and Moyle 2010). They are a large piscivorous minnow, whose populations have thrived and are known to consume juvenile salmonids throughout the Eel River Basin. (NMFS 2007).

4.4. Status of Designated Critical Habitat in the Action Area for Fish Species

The portion of Mill Creek within the Action Area is designated critical habitat for Chinook Salmon, Coho Salmon, and Steelhead.

Chapter 5. Effects of the Project on the Action Area

5.1. Deconstruct Action

5.1.1. Construction Scenario (summary)

The proposed project would remove and replace an existing bridge over Mill Creek and improve Hill Road for approximately 61 meters (200 feet) on either side of the bridge. Traffic would be rerouted during construction. Designated staging and parking areas would be established along Hill Road, on either side of the creek, and situated a minimum of 30 meters (100 feet) from the creek. Construction activities along the creek banks are proposed for the summer when there are often no flows within the Action Area. No dewatering is anticipated to be required as no work below ordinary high water is proposed. Pile driving is required to install the foundation for the new bridge abutments. Areas disturbed during construction would be recontoured to match adjacent areas and RSP applied where applicable to prevent erosion. Improvements to Hill Road would require minimal vegetation trimming and tree removal. Once construction of the new bridge and road improvements are complete, exposed and disturbed areas would be revegetated with seed and willow cuttings, where appropriate.

The total construction disturbance area is estimated to be 0.36 hectares (0.9 acre). Permanent impacts from the proposed project are anticipated to be limited to the areas of expansion on the roadway approaches, areas along the creek where the new abutments will be placed, and the slightly widened bridge footprint. The proposed project does not include permanent impacts to Mill Creek channel, however the project would permanently place rip rap along the eastern and western banks and around the abutments. Temporary impacts are anticipated to be limited to the areas used for construction access into the creek channel as well as areas under and immediately surrounding the bridge.

Temporary direct impacts would include noise and vibration from pile driving and construction activities. If water is present in the channel between June and October, the flow will be diverted by either placing sandbags, installing two sets of k-rails and a rubber lining, installing super sacks, or installing sheetpiles along the construction area to allow low flow to continue through the construction area. Depending on the amount of flow present the contractor shall implement one of the above-listed diversion tactics. If flow is shallow, sand bags can be placed along the construction area. If there is a greater amount of flow present either the k-rail, super sack, or sheetpile option could be implemented. If there is no flow during the construction period (typical of late summer/early fall most years), diversion may be unnecessary or optional.

Under implementation of the k-rail diversion technique, the channel bottom would need to be excavated so the rubber lining lies flat along the bottom of the channel. Then two rows of k-rails will be installed parallel to the creek banks to hold the lining in place and keep the flow away from the construction activities. Under implementation of the super sacks, some excavation would also need

to occur to place a plastic lining, and then two large sacks filled with rock would be positioned along each creek bank. For both the k-rail and super sack dewatering options some gravel would be placed on the lining to provide habitat for amphibians as well as passage for fish species. Under implementation of the sheetpile diversion method, temporary sheetpiles will be advanced or pushed into the sediments using non-vibratory methods along both creek banks.

If flow is present and dewatering is required, block nets would first be placed at each end and qualified biologists would capture and relocate any native fish or other native aquatic species present in the reach to be dewatered. Once dewatering is implemented and flow is diverted away from the construction area, a biologist would be present and any standing water would be observed for fish. All fish located within the construction area immediately prior to or during dewatering will be captured by seine, dip net, and/or electrofisher and removed by qualified biologists pre-approved by NMFS. The fish will be placed in an aerated cooler or 5-gallon bucket of water from the habitat they were captured in and then be relocated within 30 minutes of capture to suitable habitat within the action area, but outside the immediate project footprint. Fish relocation will occur during the work window and is only anticipated to occur for one construction season, only if flow or remnant pools are present, and be conducted by qualified fisheries biologists. A relocation plan would be prepared and submitted to NMFS for approval at least two weeks prior to the start of construction.

If a remnant pool is present in the work area with no flow and no connection to other standing water, methods would be as immediately above except with no diversion. Biologists would stand by during dewatering to relocate native aquatic organisms.

If it is determined during final design that a diversion method would result in additional impacts not fully analyzed in this biological assessment (pile driving which extends noise/vibration impacts, grading of the channel which could result in adverse effects to ESA-listed species) then that method would not be utilized.

There would be placement of approximately 2,600 square feet (90 linear feet) of rock slope protection (RSP) along the eastern bank and approximately 3,100 square feet (95 linear feet) of RSP on the western bank; however, this would be above the low-flow channel.

5.1.2. Sequencing and Schedule

Construction is anticipated to begin in March 2024 and continue through November 2024. The project would be conducted during one construction season and take approximately eight months to complete. Construction activities within the banks of Mill Creek will be performed between June 15 and October 15, but only when there is little or no stream flow. Project construction would be restricted to daylight hours.

Phases of construction activity (in the approximate order of occurrence) are summarized as follows:

1. Vegetation trimming and removal
2. Dewatering, if necessary
3. Bridge demolition
4. Pile driving (within the banks of Mill Creek)
5. Bridge construction
6. Hill Road improvements

7. Revegetation

These phases are intended to represent distinct activities within the proposed Project for clarity of discussion regarding potential stressors to biological resources in this document. The phases listed above are not intended as actual engineering steps or contractor methods.

5.1.3. Stressors from Project Actions

Stressors induce an adverse response in an organism by any physical, chemical, or biological alteration of the environment (or resource) that can lead to a response from the individual. Stressors can act directly on an individual, or indirectly through effects to a resource. Primary stressors to biological resources from the proposed project could result from vegetation trimming and removal, dewatering (if necessary), and pile driving. Other stressors could result from the general increase of activity on-site.

Vegetation Trimming and Removal

Vegetation removal is needed to build a temporary road down to the creek bed (for pile driving) and improve access to the new bridge from Hill Road. Although the footprint of the new bridge and approaches are in the same location as the existing features to minimize impacts.

Approximately 453 m^2 (0.1 acre) of valley oak woodland habitat will be affected by widening Hill Road on either side of the bridge and installation of the new abutments (Appendix A, Figure 5). This area is limited to a narrow strip along the alignment and may require nothing further than temporary impacts from removing understory vegetation and trimming of overhanging branches to accommodate the increased width. Construction would require removal of approximately thirty trees (alder, willow, and oaks), as well as understory shrubs and various grasses. The majority of the trees to be removed have tree trunk diameters less than four inches diameter at breast height (dbh), although four of the trees have diameters greater than twelve inches. , In total, seven oak trees (five with a tree trunk diameter greater than 12 inches and two with a diameter of 10 inches or smaller), one pine tree (14 inches in diameter), seven willow trees (four with a tree trunk diameter greater than 12 inches and three with a diameter of 10 inches or smaller), and six madrone trees (all smaller than 10 inches in diameter) may be removed (Figure 11, Table 2). If the impacts to oak trees are limited to brushing, this may be considered a temporary impact. No blue oak woodland would be impacted.

Table 2. Project Impacts to Tree Species from the Hill Road Bridge at Mill Creek Replacement Project

Tree type	# Trees with DBH >12	# Trees with DBH ≤ 10	Total # of trees to be removed
Oak	5	2	7
Pine	1	-	1
Willow	4	3	7
Madrone	-	6	6

Trimming and removal of vegetation decreases potential cover and nest area. Vegetation removal can also result in fragmented habitat and disturbed areas of ground that could support leading edge invasive species. Reduced shading could also contribute to warmer water temperatures in an already excessively warm stream.

Dewatering, if necessary

Dewatering would be necessary prior to construction activities within the bed of Mill Creek, if low flows persist into August.

Dewatering could cause fish species to become stranded or trapped. Increased turbidity and bank scour could also occur when flows are diverted or reintroduced. Translocation of salmonids, if present, would require incidental take authorization.

Pile Driving

Pile driving is required when installing the new bridge abutments. No pile driving would occur in-water. No impacts to salmonids are expected from pile driving because salmonids present, if any, in remnant pools would be relocated prior to the beginning of construction.

Fish Relocation

If any salmonids or other native species are present in remnant pools within the work area, the pools would be dewatered and animals relocated to the nearest suitable habitat outside of the potential impact area, using methods described above. Even using the best available methods, there is a small risk of mortality related to capture and handling. Even successful relocation is a stressor, however handling duration would be brief (less than 30 minutes) to minimize stress. Animals would be maintained in aerated coolers and separated by species and size class during the brief handling interval.

Other Stressors

The Action Area would be disturbed by general construction activities. Stressors associated with construction activities typically can include: a) an increase in human presence and possible vehicle strikes; b) an increase in ambient noise levels; and c) fugitive dust that reduces air quality. General

construction peak noise levels would be less than pile driving, but may be sustained for longer periods of time.

5.1.4. Project Operation and Maintenance

Restoration activities would include planting native species and specifically willow cuttings that, when established, could provide increased shade for a portion of Mill Creek and additional riparian habitat for birds and other wildlife. The majority of the area disturbed during construction will be seeded and mulched. The vegetation is expected to receive enough water through natural weather processes; so, the Action Area would not be disturbed further after the initial plantings and application of seed unless an unforeseen event resulted in failure of the majority of restoration area.

The RSP proposed for erosion control would not require additional manipulation following completion of the project.

The new bridge would be made of weathering steel, a special alloy that is designed to form an exterior rust barrier, providing a low-maintenance surface that does not require cleaning or painting. Therefore, the structure would not require any foreseeable maintenance.

5.2. Exposure to Stressors from the Action

Exposures are defined as the interaction of the species, their resources, and the stressors that result from the project action.

Vegetation Trimming and Removal

Trees and shrubs provide potential nest and cover sites for wildlife, specifically birds. The loss of an active nest would be direct exposure to this stressor. The reduction of potential nest and cover sites that result in higher competition in adjacent areas would be an indirect stressor. Also, disturbed ground can support leading edge invasive species that indirectly, over time result in higher competition and loss of native species. Tree removal would also reduce shading over a very short segment of the already warm Mill Creek, although replanting would eventually replace and possibly slightly increase shading.

Dewatering, if necessary

Injury or mortality of fish resulting from dewatering activities would be direct exposure to this stressor. Pre-construction surveys and translocation of fish would reduce but not eliminate the risk of harm. Increased turbidity or degradation of the creek from project activities would indirectly stress fish species if present and possibly impacting populations over time. Relocation of fish has a small risk of mortality associated with handling, even using the best available methods.

Pile Driving

Pile driving would not occur in-water and would take place after any sensitive species present have been relocated, therefore no impacts are anticipated to occur to salmonids from pile driving.

Other Stressors

Accidental mortality of wildlife, possibly the result of a vehicle strike, from increased human activity would be direct exposure. Disturbance from construction activities including equipment noise or human presence that results in wildlife relocating to areas of higher competition would be indirect exposure.

5.3. Response to the Exposure

Fish Species

Habitat for Steelhead would be directly impacted by dewatering, if necessary during a single summer of construction. The species, if present, would be directly impacted by dewatering activities.

However, pile driving would not occur in-water and would take place after any sensitive species present have been relocated, therefore no impacts are anticipated to occur to salmonids from pile driving.

The data analyzed for this project (Appendix C) indicate that no portion of Mill Creek would receive single strike sound exposure level's (SEL) above 150 dB during either impact or vibratory pile driving; therefore, there would be no accumulation of the SEL's that would cause injury to fish in the creek. However, during the pile driving there would be portions of the creek about 115 feet (35 meters) from the piles that would receive levels of 150 dB root mean square if water is present. Figure 6 (Appendix B) shows the limits of the 150 dB fish harassment zone. However, no pile driving would occur in-water therefore no construction noise-related impacts are expected. As the project does not include in-water work, the Hydroacoustic Assessment (Attachment C) is no longer relevant.

5.4. Effects of the Action

Effect is a description of the manner in which the action may affect any listed species or critical habitat and an analysis of any cumulative effect (50 CFR 402.02). The effect of the action is the consequence (behavioral, physical, or physiological) of a response to a stressor.

Chinook Salmon and Steelhead

Dewatering, if necessary, during demolition and construction of the new bridge would directly impact listed salmonids if they are present at the time of construction. The project limits would be impassable to fish species during dewatering; and the timeframe of proposed activity is outside typical fish runs. If any salmonids are present, they would be relocated prior to dewatering.

Critical Habitat

The proposed project would replace an existing bridge and would not result in any permanent modification of designated critical habitat.

5.5. Conservation Measures and Compensation Proposal

5.5.1. Conservation Measures

Conservation measures developed to offset project effects to listed species are as follows:

1. Bridge design shall include a single-span weathering steel truss bridge with no in-channel piers.
2. The new bridge shall be in the same location as the old bridge, constructed immediately following demolition of the existing bridge, to minimize tree removal and disturbance to the creek banks.
3. The project footprint shall be minimized to the extent practicable.
4. Work in Mill Creek channel shall be restricted to the period from June 15 to October 15 when channel is driest.
5. A smooth transition equivalent to adjacent banks would be developed into and out of the stream section at the new bridge. The finished slopes of the banks would be armored with RSP to prevent erosion.
6. A qualified biologist shall educate crews (during an on-site tailgate meeting) about sensitive biological resources that may occur within the project footprint. The tailboard would include identification and life history of species potentially present, applicable regulations, species protection measures, communication protocols, and consequences of non-compliance.
7. Disturbed areas would be stabilized with RSP or re-vegetated with fast-growing native plants, including locally sourced willow cuttings along with biodegradable commercial hydraulic mulching materials.
8. If water is present in the creek during in-channel construction activities, the flow shall be diverted by either placing sandbags, installing two sets of k-rails and a rubber lining, installing super sacks, or installing sheetpiles along the construction area to allow low flow to continue through the construction areaOnce the dewatering method is installed, block nets would first be placed at each end and qualified biologists would capture and relocate any native fish or other native aquatic species present in the reach to be dewatered. Once dewatering is implemented and flow is diverted away from the construction area, a biologist would be present and any standing water would be observed for fish. All fish located within the construction area immediately prior to or during dewatering will be captured by seine, dip net, and/or electrofisher and removed by qualified biologists pre-approved by NMFS. Upon Project completion, the dewatering method will be removed from the channel.
9. Construction equipment shall be cleaned and inspected prior to use. Servicing of vehicles shall be conducted a minimum of 100 feet from Mill Creek at designated staging areas to avoid contamination through accidental drips and spills.

10. The contractor shall comply with the Caltrans Construction Site BMPs Manual section NS13: Material and Equipment Use Over Water.

11. On-site stockpiles shall be isolated with a silt fence, filter fabric, and/or straw bales/fiber rolls. Silt fence and/or fiber rolls will also be placed at bridge abutments, new abutment excavation areas, and any other locations when work could result in loose sediment possibly entering the creek. The silt fence/fiber rolls would be maintained and kept in place for the duration of the project. Any sediment or debris captured by the fence/rolls will be removed before the fence/rolls are pulled. Additional erosion, sediment, and material stockpile BMPs would be employed, as necessary, between work areas and the adjacent waterway. No fill or runoff would be allowed to enter the waterway.

12. The construction zone shall be kept free from litter by providing suitable disposal containers for trash and all construction-generated material wastes. These containers shall be emptied at regular intervals and the contents properly disposed. The containers shall have covers that can be completely closed and secured.

13. Construction shall be restricted to daylight hours.

14. On-site personnel associated with McDOT, Caltrans, or the contractor shall not have pets within the Action Area; nor shall they engage in hunting or fishing within the Action Area.

15. Disturbance to special status fish species would be minimized. If water is present, surveys for listed fish species shall be conducted by a qualified biologist in pooled or moving water within 200 feet of the bridge seven days prior to the beginning of construction (including any creek diversion or dewatering activities). If discovered, additional fish protection activities would be coordinated with NMFS and may include translocation of steelhead under incidental take authority (See below dewatering description). A suitable release location would be identified in advance within Mill Creek, and a translocation plan prepared for agency pre-approval. Translocation would be carried out by a qualified biologist pre-approved by NMFS. Additional efforts may include high visibility fencing to keep construction activities separate from ponded water, and daily construction monitoring. Also, downed trees, stumps, and other refugias within aquatic areas would remain undisturbed as much as possible.

16. No pile driving would occur in the wetted portion of the channel.

17. Creek banks would be re-contoured to match the existing bank slopes, or to a maximum 2:1 slope, where existing abutments are removed. After obtaining the engineered grade of the channel banks, approximately 2,600 square feet (90 linear feet) of RSP would be placed on the eastern bank and 3,100 square feet (95 linear feet) of RSP would be placed on the western bank to armor and protect the channel banks from potential erosion.

18. A Stream Diversion and Relocation Plan will be prepared prior to construction.

Dewatering

If water is present in the channel between June and October, the flow will be diverted by either placing sandbags, installing two sets of k-rails and a rubber lining, installing super sacks, or installing sheetpiles along the construction area to allow low flow to continue through the construction area. Depending on the amount of flow present the contractor shall implement one of the above-listed diversion tactics. If flow is shallow, sand bags can be placed along the construction area. If there is a greater amount of flow present either the k-rail, super sack, or sheetpile option could be implemented. If there is no flow during the construction period (typical of late summer/early fall most years), diversion may be unnecessary or optional.

Under implementation of the k-rail diversion technique, the channel bottom would need to be excavated so the rubber lining lies flat along the bottom of the channel. Then two rows of k-rails will be installed parallel to the creek banks to hold the lining in place and keep the flow away from the construction activities. Under implementation of the super sacks, some excavation would also need to occur to place a plastic lining, and then two large sacks filled with rock would be positioned along each creek bank. For both the k-rail and super sack dewatering options some gravel would be placed on the lining to provide habitat for amphibians as well as passage for fish species. Under implementation of the sheetpile diversion method, temporary sheetpiles will be advanced or pushed into the sediments using non-vibratory methods along both creek banks.

If flow is present and dewatering is required, block nets would first be placed at each end and qualified biologists would capture and relocate any native fish or other native aquatic species present in the reach to be dewatered. Once dewatering is implemented and flow is diverted away from the construction area, a biologist would be present and any standing water would be observed for fish. All fish located within the construction area immediately prior to or during dewatering will be captured by seine, dip net, and/or electrofisher and removed by qualified biologists pre-approved by NMFS. The fish will be placed in an aerated cooler or 5-gallon bucket of water from the habitat they were captured in and then be relocated within 30 minutes of capture to suitable habitat within the action area, but outside the immediate project footprint. Fish relocation will occur during the work window and is only anticipated to occur for one construction season, only if flow or remnant pools are present, and be conducted by qualified fisheries biologists. A relocation plan would be prepared and submitted to NMFS for approval at least two weeks prior to the start of construction.

If it is determined during final design that a diversion method would result in additional impacts not fully analyzed in this biological assessment (piledriving which extends noise/vibration impacts, grading of the channel which could result in adverse effects to ESA-listed species) then that method would not be utilized.

5.5.2. Compensation

The proposed project involves on-site revegetation of disturbed areas and willow plantings. Off-site improvements or other compensation is not required to offset project effects.

5.6. Effects of Interrelated and Interdependent Actions/Conclusions and Determination

Interrelated actions are actions that are part of a larger action and depend on the larger action for their justification [50 CFR §402.02] (i.e., this project would not occur “but for” a larger project). Interrelated actions are typically associated with the proposed action. .

Interdependent actions are actions having no independent utility apart from the proposed action under consideration [50 CFR §402.02].

There are no known interrelated or interdependent actions related to the proposed project.

5.7. Cumulative Effects

Cumulative effects include the effects of future state, tribal, local or private actions that are reasonably certain to occur in the action area described in this biological assessment. Future federal actions that are unrelated to the proposed action are not considered in this this section, because they require separate consultation pursuant to Section 7 of the FESA.

A proposed trail along SR 162 would cross Mill Creek well upstream of the Action Area. The trail project is presently in permitting stages.

There are no other known future projects/actions planned in the vicinity of the Action Area. Implementation of the conservation measures presented within this chapter, Section 5.5.1., would reduce the overall contribution to cumulative biological resource effects resulting from completion of the project. Therefore, proposed project contributions to the potential loss and/or restriction of biological resources in the region are considered less than significant.

5.8. Determination

5.8.1. Species and Critical Habitat Determination

A no effect determination was made for all but the following species shown on Table 1. No consultation is required for species eliminated from further consideration.

A May Affect, Likely to Adversely Affect finding was made for one species:

- Steelhead

A May Affect, Not Likely to Adversely Affect finding was made for one species:

- Chinook salmon

A May Affect, Not Likely to Adversely Modify finding was made for critical habitat for three species:

- Chinook salmon
- Coho salmon

- Steelhead

5.8.2. Discussion supporting determination

No effect determinations were made by considering habitat requirements and life history for individual species, known occurrence records, and existing site conditions. The proposed project was determined to have no effect if there is no or very limited possibility of species occurrence onsite.

Species with the potential to occur within the Action Area, but not expected to be impacted by project activities to a level that would result in take have a may affect, not likely to adversely affect, determination.

Species potentially present within the Action Area and which may, if present, be subject to direct or indirect impacts rising to the level of take have a may affect, likely to adversely affect finding.

Critical Habitat - Chinook Salmon and Steelhead

The Project is designed to replace an existing bridge with minimal disturbance to surrounding areas. There would be no placement of new permanent bridge structures in the creek channel. Thus, there would be no adverse modification of designated critical habitat.

Chapter 6. Magnuson Stevens Fishery Conservation and Management Act of 1976 (as amended)

This Act takes immediate action to conserve and manage fishery resources found off the coasts of the United States (US), and the anadromous species and Continental Shelf fishery resources of the US, by exercising sovereign rights for the purposes of exploring, exploiting, conserving, and managing all fish within the exclusive economic anadromous species, Continental Shelf fishery resources and fishery resources in the special areas.

6.1. Essential Fish Habitat

6.1.1. Essential Fish Habitat Background

Public Law 104-297, the Sustainable Fisheries Act of 1996, amended the Magnuson Stevens Fishery Conservation and Management Act (MSFCMA) to establish new requirements for EFH descriptions in federal fishery management plans. In addition, the MSFCMA established procedures designed to identify, conserve, and enhance EFH for those species regulated under a federal fisheries management plan. Pursuant to the MSFCMA:

- Federal agencies must consult with National Oceanic and Atmospheric Administration (NOAA) Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH;
- NOAA Fisheries must provide conservation recommendations for any federal or state action that would adversely affect EFH;
- Federal agencies must provide a detailed response in writing to the NOAA Fisheries within 30 days after receiving EFH conservation recommendations. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the effect of the activity on EFH. In the case of a response that is inconsistent with the NOAA Fisheries' EFH conservation recommendations, the federal agency must explain its reasons for not following the recommendations.

EFH has been defined for the purposes of the Magnuson-Stevens Act as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (50 CFR § 600.10). NOAA Fisheries has further added the following interpretations to clarify this definition:

- **"Waters"** include aquatic areas and their associated physical, chemical, and biological properties that are used by fish, and may include areas historically used by fish where appropriate;
- **"Substrate"** includes sediment, hard bottom, structures underlying the waters, and associated biological communities;
- **"Necessary"** means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and

- **“Spawning, breeding, feeding, or growth to maturity”** covers the full life cycle of a species.

Adverse effect means any effect that reduces quality and/or quantity of EFH, and may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey or reduction in species fecundity), or site-specific or habitat-wide effects, including individual, cumulative, or synergistic consequences of actions.

EFH consultation with the NOAA Fisheries is required regarding any federal agency action that may adversely affect EFH, including actions that occur outside EFH, such as certain upstream and upslope activities.

The objectives of this EFH consultation are to determine whether the Proposed Action would adversely affect designated EFH and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH. The Magnuson-Stevens Act requires consultation for all federal agency actions that may adversely affect EFH. EFH consultation with NOAA Fisheries is required by federal agencies undertaking, permitting, or funding activities that may adversely affect EFH, regardless of its location. Under Section 305(b)(4) of the MSFCMA, NOAA Fisheries is required to provide EFH conservation and enhancement recommendations to federal and state agencies for actions that adversely affect EFH. Wherever possible, NOAA Fisheries utilizes existing interagency coordination processes to fulfill EFH consultations with federal agencies. For the proposed action, this goal is being met by incorporating EFH consultation into the FESA Section 7 consultation, as represented by this BA.

Mill Creek is considered EFH for Pacific Coast Salmon. Species included on this list are Chinook Salmon, Coho Salmon, and Puget Sound Pink Salmon. However, none of these species have recent documented presence in Mill Creek. Due to the nature of the Project, there is a potential for adverse effects to Pacific Coast Salmon from potential sediment or contaminant releases into Mill Creek. However, the project makes up a very small portion of the creek and activities will be of a short duration. In addition, mitigation and conservation measures will be implemented to ensure that the Project avoids and/or minimizes any adverse effects. The proposed Project would have minimal to no effects on EFH.

6.2. Managed Fisheries with Potential to Occur in the Action Area

The MSFCMA requires that EFH be identified for all federally managed species including all species managed by the Pacific Fisheries Management Council (PFMC). The PFMC is responsible for managing commercial fisheries resources along the coast of Washington, Oregon, and California. No species managed under a Fisheries Management Plant (FMP) have a potential to occur in the Action Area.

6.3. Potential Adverse Effects of Proposed Project on EFH

6.3.1. Adverse Effect on Essential Fish Habitat for Pacific Salmonids

As a result of construction activities, the following adverse effects could potentially occur to Pacific Salmon EFH:

- Increased Dust/Sediment
- Contaminant Spills

6.4. Essential Fish Habitat Conservation Measures

The following measures will be implemented to minimize the potential adverse effects to designated EFH described above.

- Construction during the dry season and implementation of best management practices to reduce erosion and dust will be implemented to minimize impacts to aquatic resources.
- No construction activities shall occur during or 24-hours following a rain event.
- A SWPPP and general BMPs will be implemented to reduce potential water quality degradation, dust, or erosion to areas adjacent to construction activities.
- Grading and trenching shall be restricted to the dry season when the aquatic feature at the Action Area is completely or mostly without standing water.
- The existing limits of the south side of the road at REA shall be retained to avoid direct impacts to the aquatic feature (i.e., the road shall not be widened to the south).
- All disturbed areas that drain water (i.e., the culvert and roadside depression) will be replaced and re-contoured to pre-construction conditions.

6.5. Conclusions

The project makes up a very small portion of the creek and activities will be of a short duration. In addition, mitigation and conservation measures will be implemented to ensure that the Project avoids and/or minimizes any adverse effects. The proposed Project would have minimal to no effects on EFH.

CalTrans has determined that, with implementation of proposed conservation measures the proposed action will not adversely affect EFH for Pacific Coast Salmon.

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Appendix A Database Searches

Appendix C(1), Table 1. Hill Road Bridge at Mill Creek Bridge Replacement Project – 9-Quad Database Search of CDFW CNDDB centered on project quad (Jamison Ridge) on 11.13.2019. Quads included Jamison Ridge, Covelo West, Covelo East, Newhouse Ridge, Dos Rios, Thatcher Ridge, Willis Ridge, Brushy Mountain, and Sanhedrin Mountain.

SciName	ComName	FedList	CalList	GRank	SRank	RPlantRank	OthrStatus	Habitats	GenHab	MicroHab
Mammals										
Antrozous pallidus	Pallid Bat	N	N	G5	S3		BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern | USFS_S-Sensitive | WBWG_H-High Priority	Chaparral | Coastal scrub | Desert wash | Great Basin grassland | Great Basin scrub | Mojavean desert scrub | Riparian woodland | Sonoran desert scrub | Upper montane coniferous forest | Valley & foothill grassland	Deserts, grasslands, shrublands, woodlands and forests. Most common in open, dry habitats with rocky areas for roosting.	Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.
Corynorhinus townsendii	Townsend's Big-eared Bat	N	N	G3G4	S2		BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern | USFS_S-Sensitive | WBWG_H-High Priority	Broadleaved upland forest | Chaparral | Chenopod scrub | Great Basin grassland | Great Basin scrub | Joshua tree woodland | Lower montane coniferous forest | Meadow & seep | Mojavean desert scrub | Riparian forest | Riparian woodland | Sonoran desert scrub | Sonoran thorn woodland | Upper montane coniferous forest | Valley & foothill grassland	Throughout California in a wide variety of habitats. Most common in mesic sites.	Roosts in the open, hanging from walls and ceilings. Roosting sites limiting. Extremely sensitive to human disturbance.

Erethizon dorsatum	North American Porcupine	N	N	G5	S3		IUCN_LC-Least Concern	Broadleaved upland forest | Cismontane woodland | Closed-cone coniferous forest | Lower montane coniferous forest | North coast coniferous forest | Upper montane coniferous forest	Forested habitats in the Sierra Nevada, Cascade, and Coast ranges, with scattered observations from forested areas in the Transverse Ranges.	Wide variety of coniferous and mixed woodland habitat.
Lasiurus blossevillii	Western Red Bat	N	N	G5	S3		CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern | WBWG_H-High Priority	Cismontane woodland | Lower montane coniferous forest | Riparian forest | Riparian woodland	Roosts primarily in trees, 2-40 ft above ground, from sea level up through mixed conifer forests.	Prefers habitat edges and mosaics with trees that are protected from above and open below with open areas for foraging.
Lasiurus cinereus	Hoary Bat	N	N	G5	S4		IUCN_LC-Least Concern | WBWG_M-Medium Priority	Broadleaved upland forest | Cismontane woodland | Lower montane coniferous forest | North coast coniferous forest	Prefers open habitats or habitat mosaics, with access to trees for cover and open areas or habitat edges for feeding.	Roosts in dense foliage of medium to large trees. Feeds primarily on moths. Requires water.
Martes caurina humboldtensis	Humboldt Marten	N	SE	G5T1	S1		CDFW_SSC-Species of Special Concern | USFS_S-Sensitive	North coast coniferous forest | Oldgrowth | Redwood	Occurs only in the coastal redwood zone from the Oregon border south to Sonoma County.	Associated with late-successional coniferous forests, prefer forests with low, overhead cover.
Myotis evotis	Long-eared Myotis	N	N	G5	S3		BLM_S-Sensitive | IUCN_LC-Least Concern | WBWG_M-Medium Priority		Found in all brush, woodland and forest habitats from sea level to about 9000 ft. Prefers coniferous woodlands and forests.	Nursery colonies in buildings, crevices, spaces under bark, and snags. Caves used primarily as night roosts.
Pekania pennanti	Fisher - West Coast DPS	N	ST	G5T2T3Q	S2S3		BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | USFS_S-Sensitive	North coast coniferous forest | Oldgrowth | Riparian forest	Intermediate to large-tree stages of coniferous forests and deciduous-riparian areas with high percent canopy closure.	Uses cavities, snags, logs and rocky areas for cover and denning. Needs large areas of mature, dense forest.

Taxidea taxus	American Badger	N	N	G5	S3		CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern	Alkali marsh | Alkali playa | Alpine | Alpine dwarf scrub | Bog & fen | Brackish marsh | Broadleaved upland forest | Chaparral | Chenopod scrub | Cismontane woodland | Closed-cone coniferous forest | Coastal bluff scrub | Coastal dunes | Coastal prairie | Coastal scrub | Desert dunes | Desert wash | Freshwater marsh | Great Basin grassland | Great Basin scrub | Interior dunes | Ione formation | Joshua tree woodland | Limestone | Lower montane coniferous forest | Marsh & swamp | Meadow & seep | Mojavean desert scrub | Montane dwarf scrub | North coast coniferous forest | Oldgrowth | Pavement plain | Redwood | Riparian forest | Riparian scrub | Riparian woodland | Salt marsh | Sonoran desert scrub | Sonoran thorn woodland | Ultramafic | Upper montane coniferous forest | Upper Sonoran scrub | Valley & foothill	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils.	Needs sufficient food, friable soils and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.
Reptiles										

Emys marmorata	Western Pond Turtle	None	None	G3G4	S3		BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_VU-Vulnerable | USFS_S-Sensitive	Aquatic | Artificial flowing waters | Klamath/North coast flowing waters | Klamath/North coast standing waters | Marsh & swamp | Sacramento/San Joaquin flowing waters | Sacramento/San Joaquin standing waters | South coast flowing waters | South coast standing waters | Wetland	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation, below 6000 ft elevation.	Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.
Amphibians										
Rana boylii	Foothill Yellow-legged Frog	N	SCT	G3	S3		BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_NT-Near Threatened | USFS_S-Sensitive	Aquatic | Chaparral | Cismontane woodland | Coastal scrub | Klamath/North coast flowing waters | Lower montane coniferous forest | Meadow & seep | Riparian forest | Riparian woodland | Sacramento/San Joaquin flowing waters	Partly-shaded, shallow streams and riffles with a rocky substrate in a variety of habitats.	Needs at least some cobble-sized substrate for egg-laying. Needs at least 15 weeks to attain metamorphosis.
Fish										
Oncorhynchus mykiss irideus pop. 36	summer-run Steelhead Trout	N	SCE	G5T4Q	S2		CDFW_SSC-Species of Special Concern	Aquatic | Klamath/North coast flowing waters | Sacramento/San Joaquin flowing waters	No. Calif coastal streams south to Middle Fork Eel River. Within range of Klamath Mtns province DPS & No. Calif DPS.	Cool, swift, shallow water & clean loose gravel for spawning, & suitably large pools in which to spend the summer.
Insects										

Bombus caliginosus	Obscure Bumble Bee	N	N	G4?	S1S2		IUCN_VU-Vulnerable		Coastal areas from Santa Barabara county to north to Washington state.	Food plant genera include Baccharis, Cirsium, Lupinus, Lotus, Grindelia and Phacelia.
Bryophytes										
Trichodon cylindricus	Cylindrical Trichodon	N	N	G4G5	S2	2B.2		Broadleaved upland forest | Meadow & seep | Upper montane coniferous forest	Broadleafed upland forest, upper montane coniferous forest, meadows and seeps.	Moss growing in openings on sandy or clay soils on roadsides, stream banks, trails or in fields. 35-2005 m.
Dicots										
Anisocarpus scabridus	scabrid alpine tarplant	N	N	G3	S3	1B.3	BLM_S-Sensitive | USFS_S-Sensitive	Upper montane coniferous forest	Upper montane coniferous forest.	Open stony ridges, metamorphic scree slopes of mountain peaks, and cliffs in or near red fir forest. 1550-2350 m.
Arctostaphylos manzanita ssp. elegans	Konocti manzanita	N	N	G5T3	S3	1B.3		Chaparral | Cismontane woodland | Lower montane coniferous forest	Chaparral, cismontane woodland, lower montane coniferous forest.	Volcanic soils. 225-1830 m.
Brasenia schreberi	watershield	N	N	G5	S3	2B.3		Marsh & swamp | Wetland	Freshwater marshes and swamps.	Aquatic known from water bodies both natural and artificial in California. 1-2180 m.
Calystegia collina ssp. tridactylosa	three-fingered morning-glory	N	N	G4T1	S1	1B.2	BLM_S-Sensitive	Chaparral | Cismontane woodland | Ultramafic	Chaparral, cismontane woodland.	Rocky, gravelly openings in serpentine. 605-705 m.
Downingia willamettensis	Cascade downingia	N	N	G4	S2	2B.2		Cismontane woodland | Valley & foothill grassland | Vernal pool	Cismontane woodland, valley and foothill grasslands, vernal pools.	Lake margins. 15-1110 m.
Hesperolinon adenophyllum	glandular western flax	N	N	G2G3	S2S3	1B.2	BLM_S-Sensitive	Chaparral | Cismontane woodland | Ultramafic | Valley & foothill grassland	Chaparral, cismontane woodland, valley and foothill grassland.	Serpentine soils; generally found in sepentine chaparral. 425-1345 m.

Horkelia tenuiloba	thin-lobed horkelia	N	N	G2	S2	1B.2	BLM_S-Sensitive | SB_RSABG-Rancho Santa Ana Botanic Garden	Broadleaved upland forest | Chaparral | Valley & foothill grassland	Broadleafed upland forest, chaparral, valley and foothill grassland.	Sandy soils; mesic openings. 45-640 m.
Iliamna bakeri	Baker's globe mallow	N	N	G4	S3	4.2		Chaparral | Pinon & juniper woodlands	Chaparral, Great Basin scrub, pinyon and juniper woodland, lower montane coniferous forest.	Often in burned areas. Volcanic substrates. 1000-2500 m.
Limnanthes bakeri	Baker's meadowfoam	N	SR	G1	S1	1B.1	BLM_S-Sensitive | SB_USDA-US Dept of Agriculture	Freshwater marsh | Marsh & swamp | Meadow & seep | Valley & foothill grassland | Vernal pool | Wetland	Marshes and swamps, valley and foothill grassland, meadows and seeps, vernal pools.	Seasonally moist or saturated sites within grassland; also in swales, roadside ditches & margins of freshwater marshy areas. 175-915 m.
Lupinus milo-bakeri	Milo Baker's lupine	N	ST	G1Q	S1	1B.1	SB_RSABG-Rancho Santa Ana Botanic Garden | SB_UCBBG-UC Berkeley Botanical Garden	Cismontane woodland | Valley & foothill grassland	Cismontane woodland, valley and foothill grassland.	In roadside ditches, dry gravelly areas along roads, and along small streams. 380-430 m.
Sidalcea oregana ssp. hydrophila	marsh checkerbloom	N	N	G5T2	S2	1B.2		Meadow & seep | Riparian forest | Wetland	Meadows and seeps, riparian forest.	Wet soil of streambanks, meadows. 455-2030 m.
Monocots										
Potamogeton epihydrus	Nuttall's ribbon-leaved pondweed	N	N	G5	S2S3	2B.2		Marsh & swamp | Wetland	Marshes and swamps.	Shallow water, ponds, lakes, streams, irrigation ditches. 295-2640 m.
Habitats										
Upland Douglas Fir Forest	Upland Douglas Fir Forest	N	N	G4	S3.1			North coast coniferous forest		
North Central Coast Summer Steelhead Stream	North Central Coast Summer Steelhead Stream	N	N	GNR	SNR					
Valley Oak Woodland	Valley Oak Woodland	N	N	G3	S2.1			Cismontane woodland		

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Appendix C(2), Table 1. Hill Road Bridge at Mill Creek Bridge Replacement Project – 9-Quad Database Search of CNPS Rare Plant Inventory centered on project quad (Jamison Ridge) on 11.13.2019. Quads included Jamison Ridge, Covelo West, Covelo East, Newhouse Ridge, Dos Rios, Thatcher Ridge, Willis Ridge, Brushy Mountain, and Sanhedrin Mountain.								
Scientific Name	Common Name	FESA	CESA	GRank	SRank	RPlantRank	Habitat	Micro Habitat
Plants								
Anisocarpus scabridus	scabrid alpine tarplant	N	N	G3	S3	1B.3	Upper montane coniferous forest (metamorphic, rocky)	
Arctostaphylos manzanita ssp. elegans	Konocti manzanita	N	N	G5T3	S3	1B.3	Chaparral, Cismontane woodland, Lower montane coniferous forest	volcanic
Astragalus rattanii var. rattanii	Rattan's milk-vetch	N	N	G4T4	S4	4.3	Chaparral, Cismontane woodland, Lower montane coniferous forest	gravelly streambanks
Brasenia schreberi	watershield	N	N	G5	S3	2B.3	Marshes and swamps (freshwater)	
Calystegia collina ssp. tridactylosa	three-fingered morning-glory	N	N	G4T1	S1	1B.2	Chaparral, Cismontane woodland	serpentinite, rocky, gravelly, openings
Downingia willamettensis	Cascade downingia	N	N	G4	S2	2B.2	Cismontane woodland (lake margins), Valley and foothill grassland (lake margins), Vernal pools	
Fritillaria glauca	Siskiyou fritillaria	N	N	G3G4	S3	4.2	Alpine boulder and rock field, Subalpine coniferous forest, Upper montane coniferous forest	serpentinite, talus slopes
Hesperolinon adenophyllum	glandular western flax	N	N	G2G3	S2S3	1B.2	Chaparral, Cismontane woodland, Valley and foothill grassland	usually serpentinite
Horkelia tenuiloba	thin-lobed horkelia	N	N	G2	S2	1B.2	Broadleafed upland forest, Chaparral, Valley and foothill grassland	mesic openings, sandy

Iliamna bakeri	Baker's globe mallow	N	N	G4	S3	4.2	Chaparral, Great Basin scrub, Lower montane coniferous forest (openings), Pinyon and juniper woodland	volcanic, often in burned areas
Limnanthes bakeri	Baker's meadowfoam	N	CR	G1	S1	1B.1	Meadows and seeps, Marshes and swamps (freshwater), Valley and foothill grassland (vernally mesic), Vernal pools	
Lupinus milo-bakeri	Milo Baker's lupine	N	CT	G1Q	S1	1B.1	Cismontane woodland (often along roadsides), Valley and foothill grassland	
Piperia candida	white-flowered rein orchid	N	N	G3	S3	1B.2	Broadleafed upland forest, Lower montane coniferous forest, North Coast coniferous forest	sometimes serpentinite
Potamogeton epihydrus	Nuttall's ribbon-leaved pondweed	N	N	G5	S2S3	2B.2	Marshes and swamps (assorted shallow freshwater)	
Sidalcea oregana ssp. hydrophila	marsh checkerbloom	N	N	G5T2	S2	1B.2	Meadows and seeps, Riparian forest	mesic
Trichodon cylindricus	cylindrical trichodon	N	N	G4	S2	2B.2	Broadleafed upland forest, Meadows and seeps, Upper montane coniferous forest	sandy, exposed soil, roadbanks

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Appendix C(3), Table 1. Hill Road Bridge at Mill Creek Bridge Replacement Project – 9-Quad Database Search of USFWS IPaC centered on project quad (Jamison Ridge) on 11.13.2019. Quads included Jamison Ridge, Covelo West, Covelo East, Newhouse Ridge, Dos Rios, Thatcher Ridge, Willis Ridge, Brushy Mountain, and Sanhedrin Mountain.

SciName	ComName	FedList	CalList	GRank	SRank	RPlantRank	OthrStatus	Habitats	GenHab	MicroHab
Mammals										
Pekania pennanti	Fisher - West Coast DPS	N	ST	G5T2T3Q	S2S3		BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | USFS_S-Sensitive	North coast coniferous forest | Oldgrowth | Riparian forest	Intermediate to large-tree stages of coniferous forests and deciduous-riparian areas with high percent canopy closure.	Uses cavities, snags, logs and rocky areas for cover and denning. Needs large areas of mature, dense forest.
Birds										
Brachyramphus marmoratus	Marbled Murrelet	FT	SE	G3G4	S1		CDF_S-Sensitive | IUCN_EN-Endangered | NABCI_RWL-Red Watch List	Lower montane coniferous forest | Oldgrowth | Redwood	Feeds near-shore; nests inland along coast from Eureka to Oregon border and from Half Moon Bay to Santa Cruz.	Nests in old-growth redwood-dominated forests, up to six miles inland, often in Douglas-fir.
Charadrius alexandrinus nivosus	Western Snowy Plover	FT	N	G3T3	S2S3		CDFW_SSC-Species of Special Concern | NABCI_RWL-Red Watch List | USFWS_BCC-Birds of Conservation Concern	Great Basin standing waters | Sand shore | Wetland	Sandy beaches, salt pond levees & shores of large alkali lakes.	Needs sandy, gravelly or friable soils for nesting.
Coccyzus americanus occidentalis	Western Yellow-billed Cuckoo	FT	SE	G5T2T3	S1		BLM_S-Sensitive | NABCI_RWL-Red Watch List | USFS_S-Sensitive | USFWS_BCC-Birds of Conservation Concern	Riparian forest	Riparian forest nester, along the broad, lower flood-bottoms of larger river systems.	Nests in riparian jungles of willow, often mixed with cottonwoods, with lower story of blackberry, nettles, or wild grape.
Strix occidentalis caurina	Northern Spotted Owl	FT	ST	G3T3	S2S3		CDF_S-Sensitive | IUCN_NT-Near Threatened | NABCI_YWL-Yellow Watch List	North coast coniferous forest | Oldgrowth | Redwood	Old-growth forests or mixed stands of old-growth and mature trees. Occasionally in younger forests with patches of big trees.	High, multistory canopy dominated by big trees, many trees with cavities or broken tops, woody debris, and space under canopy.
Amphibians										

Rana aurora	Northern Red-legged Frog	N	N	G4	S3		CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern | USFS_S-Sensitive	Klamath/North coast flowing waters | Riparian forest | Riparian woodland	Humid forests, woodlands, grasslands, and streamsides in northwestern California, usually near dense riparian cover.	Generally near permanent water, but can be found far from water, in damp woods and meadows, during non-breeding season.
Fish										
Eucyclogobius newberryi	Tidewater Goby	FE	None	G3	S3		AFS_EN-Endangered | CDFW_SSC-Species of Special Concern | IUCN_VU-Vulnerable	Aquatic | Klamath/North coast flowing waters | Sacramento/San Joaquin flowing waters | South coast flowing waters	Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith River.	Found in shallow lagoons and lower stream reaches, they need fairly still but not stagnant water and high oxygen levels.
Plants										
Howellia aquatilis	water howellia	FT	None	G3	S2	2B.2		Aquatic | Freshwater marsh | Marsh & swamp | Wetland	Freshwater marshes and swamps.	In clear ponds with other aquatics and surrounded by ponderosa pine forest and sometimes riparian associates. 1080-1375 m.
Lasthenia burkei	Burke's goldfields	FE	SE	G1	S1	1B.1	SB_RSABG-Rancho Santa Ana Botanic Garden | SB_UCBBG-UC Berkeley Botanical Garden	Meadow & seep | Vernal pool | Wetland	Vernal pools, meadows and seeps.	Most often in vernal pools and swales. 15-580 m.
Lasthenia conjugens	Contra Costa goldfields	FE	N	G1	S1	1B.1	SB_UCBBG-UC Berkeley Botanical Garden	Alkali playa | Cismontane woodland | Valley & foothill grassland | Vernal pool | Wetland	Valley and foothill grassland, vernal pools, alkaline playas, cismontane woodland.	Vernal pools, swales, low depressions, in open grassy areas. 1-450 m.
Trifolium amoenum	two-fork clover	FE	N	G1	S1	1B.1	SB_RSABG-Rancho Santa Ana Botanic Garden | SB_UCBBG-UC Berkeley Botanical Garden | SB_USDA-US Dept of Agriculture	Coastal bluff scrub | Ultramafic | Valley & foothill grassland	Valley and foothill grassland, coastal bluff scrub.	Sometimes on serpentine soil, open sunny sites, swales. Most recently cited on roadside and eroding cliff face. 5-310 m.

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Appendix C(4), Table 1. Hill Road Bridge at Mill Creek Bridge Replacement Project – 9-Quad Database Search of NMFS Database Inventory centered on project quad (Jamison Ridge) on 11.13.2019. Quads included Jamison Ridge, Covelo West, Covelo East, Newhouse Ridge, Dos Rios, Thatcher Ridge, Willis Ridge, Brushy Mountain, and Sanhedrin Mountain.

SciName	ComName	FedList	CalList	GRank	SRank	OthrStatus	Habitats	GenHab	MicroHab
Fish									
Oncorhynchus kisutch pop. 2	Coho Salmon - southern Oregon / northern California ESU	FT	ST	G4T2Q	S2?	AFS_TH-Threatened	Aquatic | Klamath/North coast flowing waters | Sacramento/San Joaquin flowing waters	Federal listing refers to populations between Cape Blanco, Oregon and Punta Gorda, Humboldt County, California.	State listing refers to populations between the Oregon border and Punta Gorda, California.
Oncorhynchus mykiss irideus pop. 16	Steelhead - northern California DPS	FT	N	G5T2T3Q	S2S3	AFS_TH-Threatened	Aquatic | Sacramento/San Joaquin flowing waters	Coastal basins from Redwood Creek south to the Gualala River, inclusive. Does not include summer-run steelhead.	
Oncorhynchus tshawytscha pop. 17	Chinook Salmon - California coastal ESU	FT	N	G5	S1	AFS_TH-Threatened	Aquatic | Sacramento/San Joaquin flowing waters	Federal listing refers to wild spawned, coastal, spring & fall runs between Redwood Cr, Humboldt Co & Russian River, Sonoma Co	

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Appendix B Project Maps

Figure 1. Project Vicinity Map



Figure 2. Project Location Map

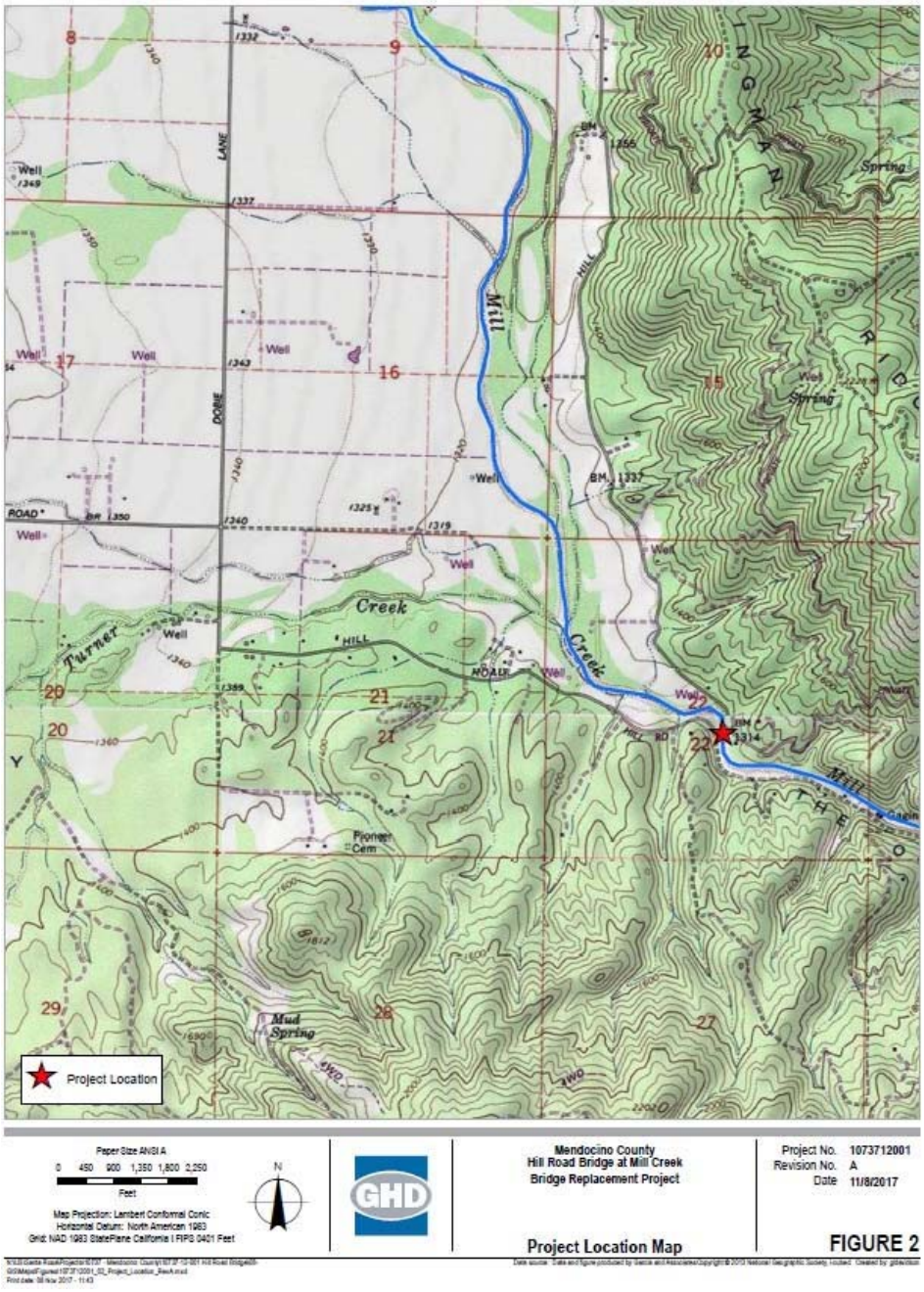


Figure 3. Project Impact Area Map

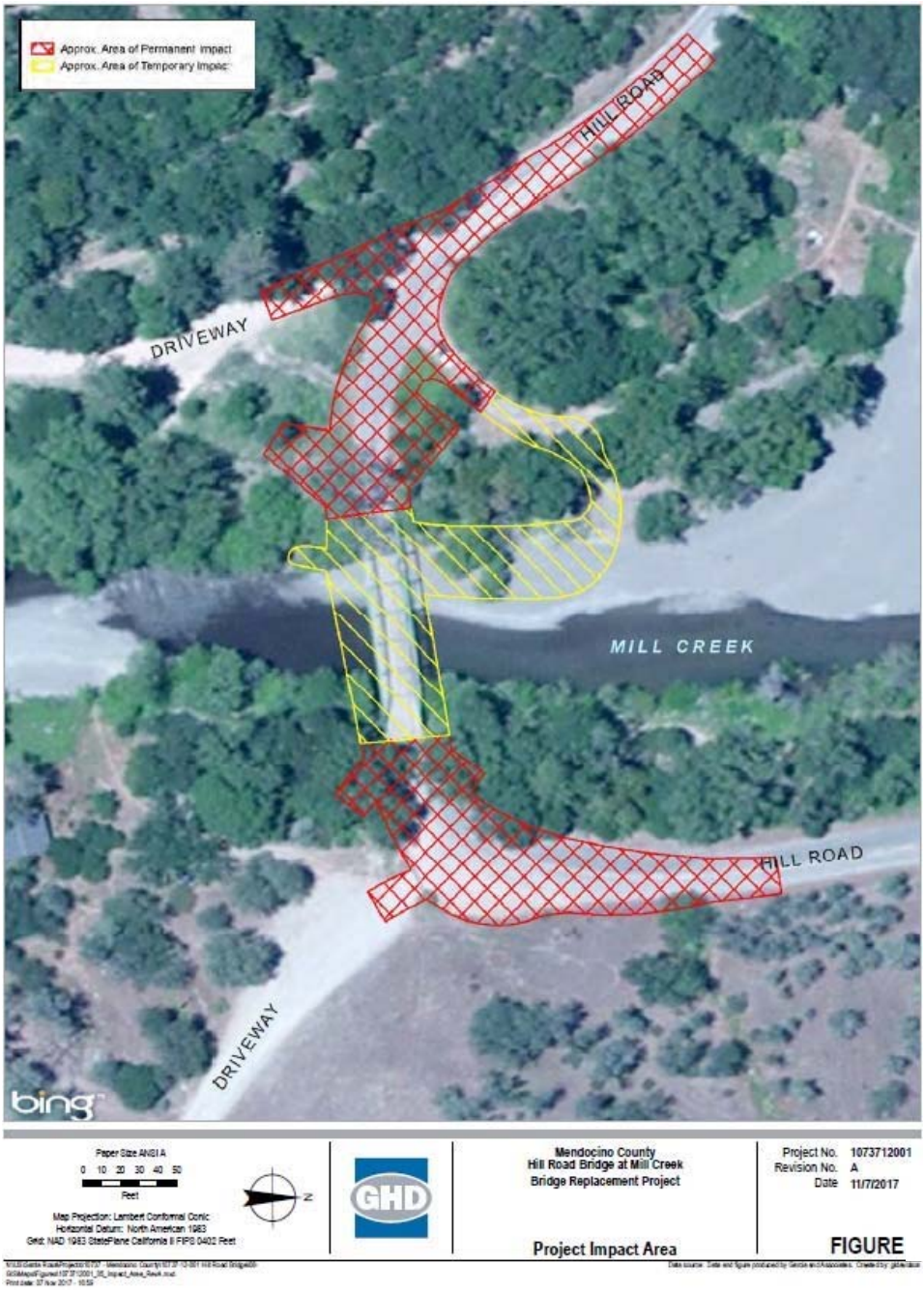


Figure 4. Action Area (or Biological Study Area) Map

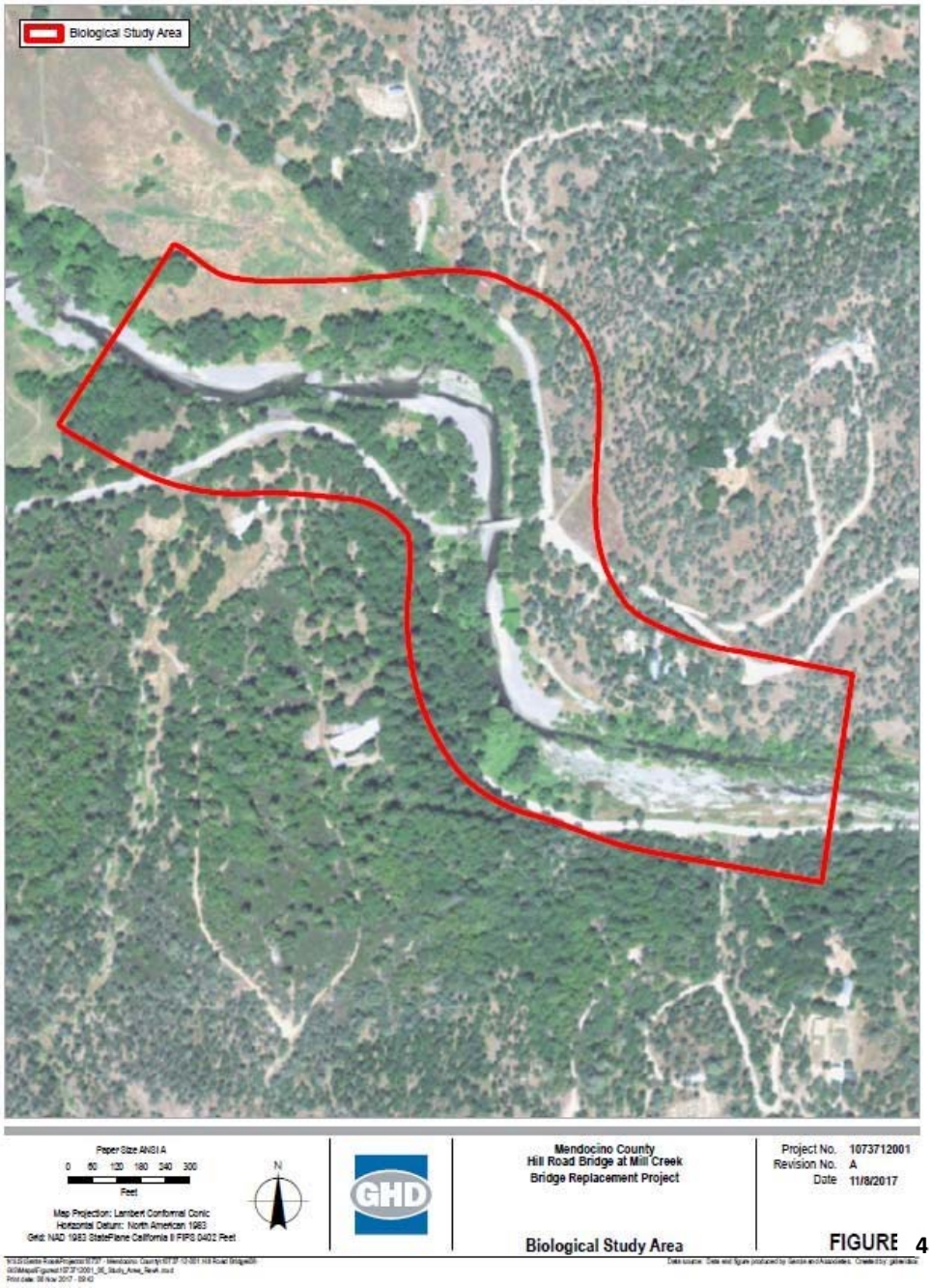
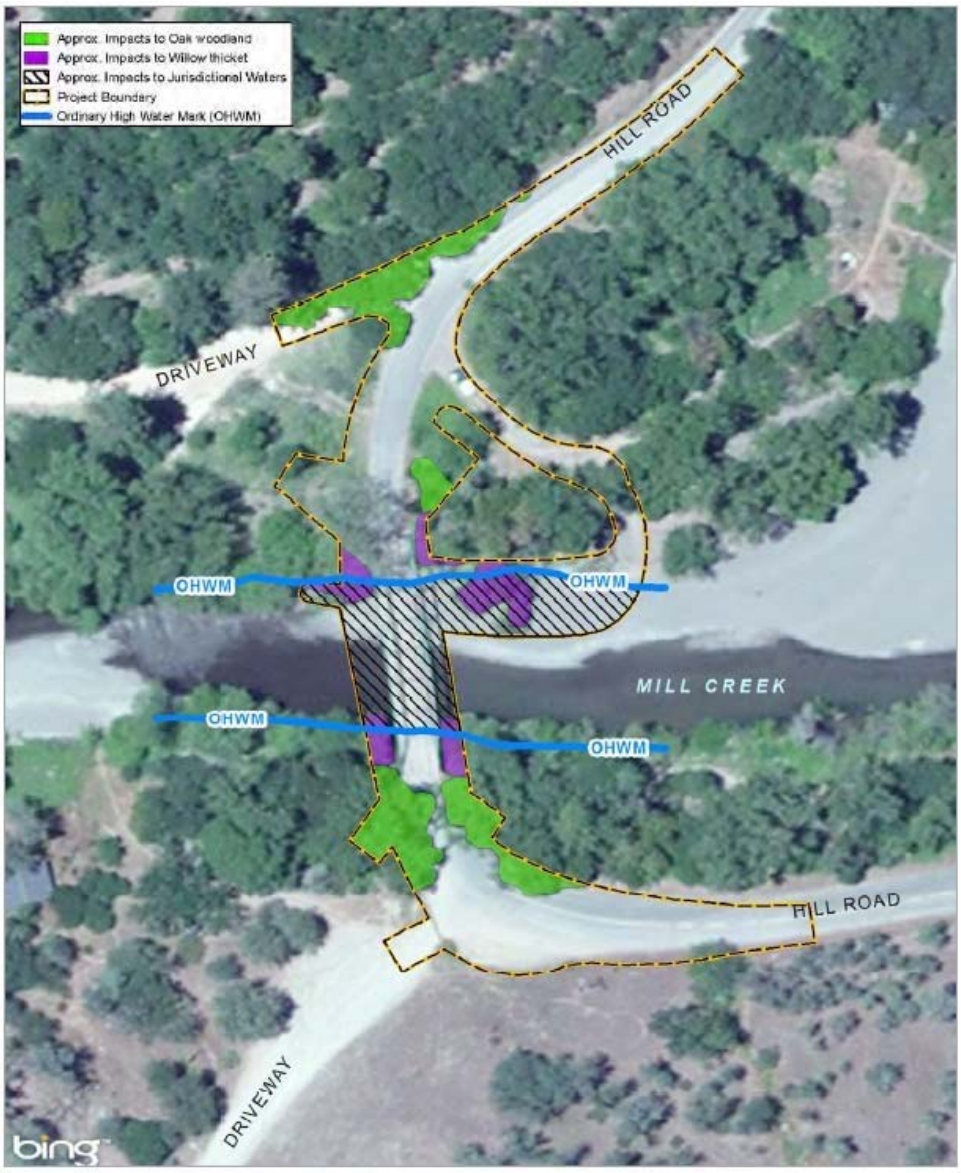


Figure 5. Habitat Impacts Map



Paper Size ANSI A
0 10 20 30 40 50
Feet
Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California II FIPS 0402 Feet

GHD

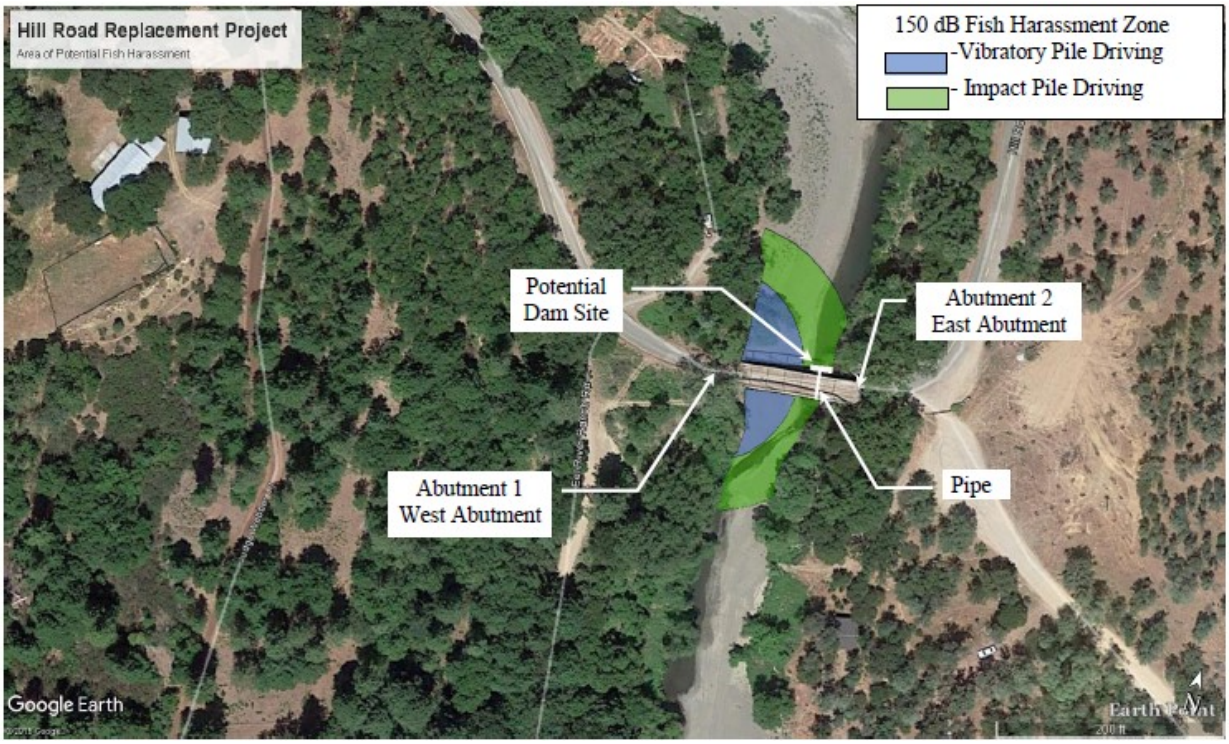
Mendocino County
Hill Road Bridge at Mill Creek
Bridge Replacement Project

Approximate Habitat Impacts

Project No. 1073712001
Revision No. A
Date 11/7/2017

FIGURE 15

Figure 6. Hill Road 150 dB RMS Fish Harassment Zone from Pile Driving.



Appendix C Analysis of Underwater Sound Levels

ANALYSIS OF UNDERWATER SOUND LEVELS – HILL ROAD BRIDGE REPLACEMENT PROJECT in Mendocino County, California

March 10, 2017 (Revised April 14, 2017)

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Project No: 12-057

INTRODUCTION

This study is an assessment of potential sound levels generated by planned pile driving activities involved with the construction of the Hill Road Bridge Replacement Project in Mendocino County, California. The proposed project would replace the existing single-lane bridge with a new two-lane bridge and widened roadway approaches. Construction of the bridge would require installation of small diameter steel shell piles as part of the abutments. This report includes the prediction of underwater sound levels calculated based on the results of measurements for similar projects. Predicted underwater sound levels are compared against interim thresholds that have been accepted by the Federal Highway Administration (FHWA), Caltrans, the National Oceanic and Atmospheric Administration (NOAA) and the California Department of Fish and Wildlife (CDFW). These thresholds are discussed in the report.

Pile driving could produce underwater noise in Mill Creek. Most of the pile driving activities will be out of the creek channel, setback from the creek. At this time, pile driving will occur at Abutment 1, west abutment, where 16-inch (0.41 meter) steel shell piles proposed. Abutment 1 piles will be 45 feet long.

There is no accurate way to predict underwater sound levels from these activities, other than to rely on acoustic data collected from similar projects. Available underwater sound data for projects involving the installation of similar piles were reviewed. The sound levels for pile driving activities proposed by the project were estimated using these data combined with an understanding of how and where these activities would occur. These predictions are essentially a best estimate based on empirical data and engineering judgment, but by their very nature have a certain degree of uncertainty associated with them. The duration of driving for each pile installation was also estimated as part of the noise prediction process. The number of piles strikes anticipated to occur was estimated from these predicted pile driving/installation times. Again, these are based on available data from similar projects and engineering estimates. The availability of data for this type of environment (i.e. shallow water in a relatively narrow creek channel) is limited.

Pile driving also causes elevated airborne sound levels, which usually cause annoyance to humans nearby. There is concern that these sound levels may affect birds in the area. This study also reports airborne sounds associated with pile driving, based on measurements of similar pile driving activities.

UNDERWATER SOUNDS FROM PILE DRIVING

Fundamentals of Underwater Noise

When a pile driving hammer strikes a pile, a pulse is created. This propagates through the pile and radiates sound into the water and the ground substrate as well as the air. Sound pressure pulse as a function of time is referred to as the waveform. Caltrans currently uses peak, root mean square (RMS), and sound exposure level (SEL) as descriptors for impulsive underwater sounds. The peak pressure is the highest absolute value of the measured waveform, and can be a negative or positive pressure peak. The RMS level is determined by analyzing the waveform and computing the average of the squared pressures over the time that comprise that portion of the waveform

containing 90 percent of the sound energy.[1] This RMS term is described as $RMS_{90\%}$ in this report. This has been approximated in the field for pile driving sounds by measuring the signal with a precision sound level meter set to the "impulse" RMS setting ($RMS_{impulse}$). Another measure of the pressure waveform that can be used to describe the pulse is the sound energy itself. The total sound energy in the pulse is referred to in many ways, such as the "total energy flux" (E_T)[2]. The "total energy flux" is equivalent to the un-weighted SEL, a common unit of sound energy used in airborne acoustics to describe short-duration events. The unit is dB re 1µPa^2-sec. In this report, peak pressures and RMS sound pressure levels are expressed in dB re 1µPa; however, in other literature they can take other forms such as a Pascal or pounds per square inch. The total sound energy in an impulse accumulates over the duration of the impulse. How rapidly the energy accumulates may be significant in assessing the potential effects of impulses on fish. Figure 1 illustrates the descriptors used to describe the acoustical characteristics of an underwater pile driving pulse. Table 1 includes the definitions of terms commonly used to describe underwater sounds.

Descriptors such as the peak pressure, $RMS_{90\%}$, and SEL or "total energy flux" are useful descriptors in describing the magnitude of these impulses. The peak pressure refers to the magnitude of maximum pressure fluctuation. The RMS averaged over 90 percent of the impulse includes averaging over a relatively long period of the impulse where the pressure fluctuation is much lower. For instance, about 50 percent of the energy from a typical pile driving impulse accumulates in less than a quarter of the time that 90 percent of the energy accumulates. The SEL or "total energy flux" is normalized to one second and, therefore, is not as useful for discerning differences in impulses where the majority of the energy occurs within 1/10th of a second. However, SEL is useful to researchers in assessing impacts to animals. The pressure waveforms show the individual characteristics of these strikes; however, it is difficult to identify any meaningful differences in the impulses. A plot showing the accumulated sound energy over the duration of the impulse (or at least the portion where much of the energy accumulates) appears to be the best available tool to illustrate the differences in source strength.

Table 1 - Definitions of Underwater Acoustical Terms

Term	Definition
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20 micro pascals (µPa) and 1 µPa for underwater.
Equivalent Noise Level, Leq	The average noise level during the measurement period.
Peak Sound Pressure, unweighted (dB)	Peak sound pressure level based on the largest absolute value of the instantaneous sound pressure. This pressure is expressed in this report as a decibel (referenced to a pressure of 1µPa) but can also be expressed in units of pressure, such as µPa or PSI.

[1] Richardson, Greene, Malone & Thomson, *Marine Mammals and Noise,* Academic Press, 1995 and Greene, personal communication.

[2] Finerran, et al., *Temporary Shift in Masked Hearing Thresholds in Odontocetes after Exposure to Single Underwater Impulses from a Seismic Watergun*, Journal of the Acoustical Society of America, June 2002.

RMS Sound Pressure Level, (NMFS Criterion)	The average of the squared pressures over the time that comprise that portion of the waveform containing 90 percent of the sound energy for one pile driving impulse.[3]
Sound Exposure Level (SEL), dB re 1µPa^2 sec	Proportionally equivalent to the time integral of the pressure squared and is described in this report in terms of dB re 1µPa^2 sec over the duration of the impulse. Similar to the unweighted Sound Exposure Level (SEL) standardized in airborne acoustics to study noise from single events.
Cumulative SEL	Measure of the total energy received through a pile driving event (here defined as pile driving over one day or maximum of 3 piles) that occurs with a day).
Waveforms, µPa over time	A graphical plot illustrating the time history of positive and negative sound pressure of individual pile strikes shown as a plot of µPa over time (i.e., seconds)
Frequency Spectra, dB over frequency range	A graphical plot illustrating the distribution of sound pressure vs. frequency for a waveform, dimension in RMS pressure and defined frequency bandwidth.

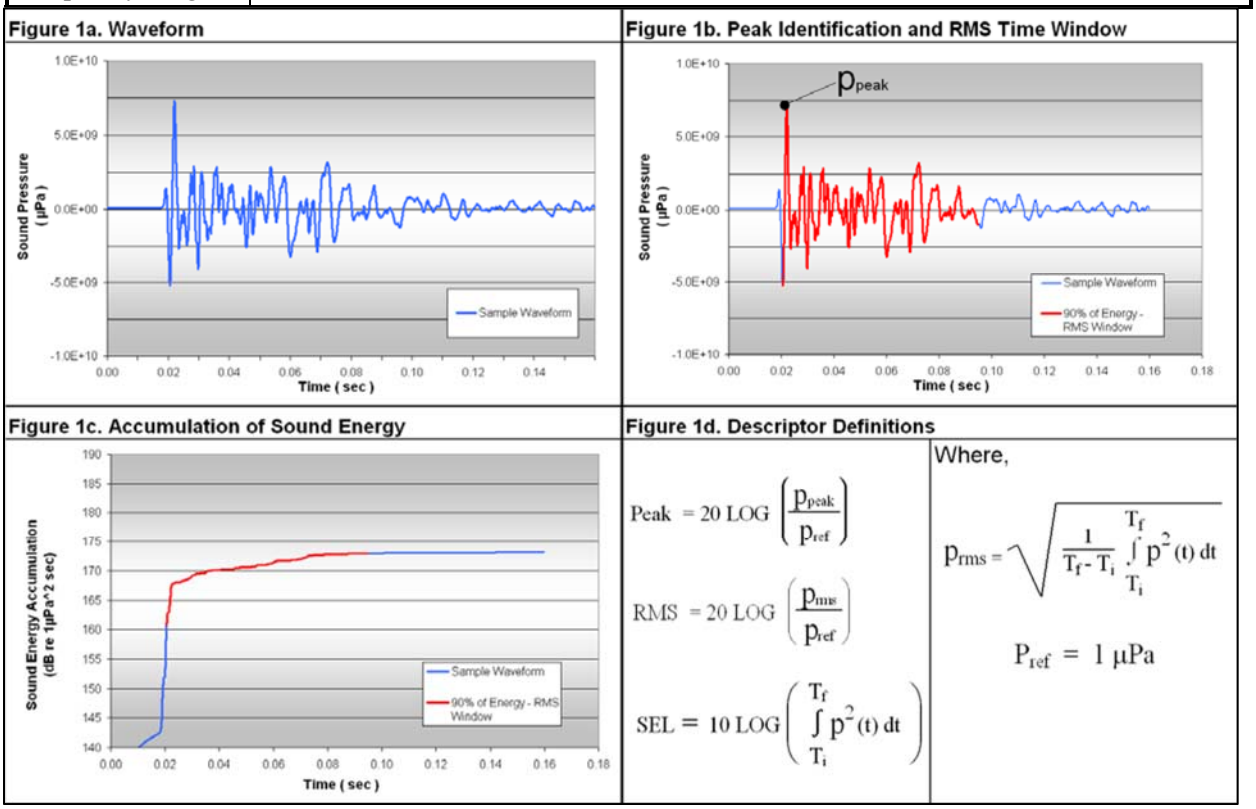


Figure 1 - Characteristics of an Underwater Pile Driving Pulse

Underwater Noise Levels from Construction

[3] The underwater sound measurement results obtained during the Pile Installation Demonstration Project indicated that most pile driving impulses occurred over a 50 to 100 millisecond (msec) period. Most of the energy was contained in the first 30 to 50 msec. Analysis of that underwater acoustic data for various pile strikes at various distances demonstrated that the acoustic signal measured using the standard "impulse exponential-time-weighting" (35-msec rise time) correlated to the RMS (impulse) level measured over the duration of the impulse.

The primary type of activity that has the potential to elevate underwater noise levels is the installation of piles. The preferred method for installation of piles for this project includes vibrating and impact driving.

Pile driving in the water causes sound energy to radiate directly into the water by vibrating the pile between the surface of the water and the creek beds, and indirectly because of ground-born vibration at the creek beds. Airborne sound makes an unsubstantial contribution to underwater sound levels because of the attenuation at the air/water interface. Pile driving near the creeks would generate low-frequency ground-born vibration that can cause localized sound pressures in the water that are radiated from the creek beds. A minimum water depth is required to allow sound to propagate. For pile driving sounds, the minimum depth is one to two meters (m). Low frequency (<100 Hz) vibration caused by pile driving and blasting could propagate through the ground only and couple to the water at the creek beds.

The likelihood of pile driving causing high widespread sound levels is low, given the depth of the water and types and sizes of piles under consideration for this project. The water surface is a pressure release zone, where the sound pressure is very low. Underwater sound measurements have shown that levels are considerably lower in the top one meter. Levels are typically highest in the deepest portions of the water column. In deeper water (i.e., 10 meters or deeper), levels are fairly uniform with depth except in the top two meters where they decrease with decreasing depth.

Hill Road Bridge Assumptions and Impacts

It is expected that the primary pile types to be driven will be as follows:

Permanent Bridge Abutment Piles - Abutment 1 (the west abutment) uses 16-inch diameter pipe piles that are approximately 45-feet in length while Abutment 2 (the east abutment) uses 24-inch diameter cast-in-drilled-hole (CIDH) piers that are approximately 30-feet in length. The Abutment 1 wing walls/retaining walls may also use 16-inch diameter pipe piles or may use 24inch diameter CIDH piers at this time this has not been decided (for the purpose of this analysis the worst case was used – 16-inch steel shell driven piles). Abutment 2 wing walls/retaining walls use 24-inch diameter CIDH piers that are approximately 30-feet in length. No pile driving will occur in the wetted channel;

- Option A – Impact drive the piles the full depth;
- Option B – Vibrate the piles in the full depth;
- Option C – A combination of first vibrating the piles in half way and driving them to the final tip elevation with a diesel impact hammer.

❖ Pile driving hammers would be on the smaller size, this assessment assumes that a Vibratory hammer similar to an American Pile Driving (APE) Model 200-6 and an impact hammer similar to an APE Model D30-32 diesel impact hammer will be used.

❖ Piles Installed Each Day/ Strikes per Day: It is assumed that all piles could be installed in about four to five days. Sixteen piles at abutment #1 and 22 piles at abutment #2. The number of strikes depends on the equipment the contractor is using; a heavy hammer will use fewer strikes. A rough guess is about 15 blows per foot, and therefore, there will be approximately 4,350 strikes per day.

- Source levels were derived from the Caltrans Technical Guidance for assessment and mitigation of the Hydroacoustic Effects of pile Driving[4]. Although the expected levels for the 16-inch piles are expected to be lower than that for 24-inch piles, there is not enough empirical data to support this. Therefore, the 24-inch data was used which would give conservative results.

Table 2 – Data used in analysis

Distances	Hammer Type	Peak	RMS	SEL
14-inch Steel Shell Piles				
10 meters [1]	Diesel Impact	175	150	137
Source: 1 – Willits Bypass Project 2014				

- A 25 log attenuation rate or drop off was used to calculate the distances from the source; this attenuation/transmission rate is high due to the fact the noise is being transmitted through a gravel riverbed and not in a water column.

Underwater Sound Thresholds

The National Marine Fisheries Service (NMFS) joined with Caltrans and other regulatory agencies and researchers to form the Fisheries Hydroacoustic Working Group (FHWG). The FHWG and NMFS issued interim guidance on hydroacoustic levels resulting from pile driving activities and subsequently agreed upon dual metric criteria of 206 dB re: 1µPa Peak Sound Pressure Level (SPL) for any single strike and an accumulated SEL of 187 dB re: 1µPa^2-s for all fish greater than 2 grams in size. The agreed upon criteria for fish less than 2 grams lowers the accumulated SEL limit to 183 dB re: 1µPa^2-second. In addition, NMFS has identified a behavioral disturbance threshold of 150 dB re: 1µPa RMS pressure for salmonids as appropriate, until new information and research indicates otherwise. The FHWG and NMFS sound-level criteria are summarized in ***Table 3***. ***Table 4*** shows the calculated distance to the adopted thresholds based on the different options described above.

Table 3 - - FHWG and NMFS Criteria for Evaluating Underwater Noise-related Effects on Fish

Effect	Metric	Fish mass	Threshold
Onset of physical injury	Peak Sound Pressure Level (SPL)	N/A	206 dB (re: 1 µPa)
	Accumulated Sound Exposure Level (SEL)	≥ 2 g	187 dB (re: 1µPa^2-sec)
		< 2 g	183 dB (re: 1µPa^2-sec)
Adverse behavioral effects	Root Mean Square pressure (RMS)	N/A	150 dB (re: 1 µPa)

[4] Caltrans. 2015. Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish. Final – November 2015.

Table 4 – Calculated Area of Impact

Description of work	Pile Location	Estimated Length (ft)		Distance to Fish Thresholds (m)			
				Cumulative SEL		206 dB Peak Threshold	150 dB RMS Threshold
		Vibratory driving	Impact driving	187 dB[5]	183 dB[1]		
Option A - Abutment Piles Impact Driven	Abutment 1	--	45	--[1]	--[1]	<10	60
Option B - Abutment Piles Vibratory Driven	Abutment 1	45	--	--[2]	--[2]	<10	27
Option C - Abutment Piles Impact and Vibratory Driven	Abutment 1	13	12	--[1]	--[1]	<10	60

foot piles at the west abutment and twenty-two (22) 25-foot piles at the east abutment. The piles sizes are 16-inch outside diameter and 0.50-inch thick.

Discussion of Underwater Noise Levels from Construction

Pile driving of the steel shell abutment piles near the creek could result in high underwater sound levels. This project includes two abutments that will support the bridge. Pile driving will be required for the West abutment, the piles for the east abutment will be cast-in-drilled-hole (CIDH) piles and pile driving will not be required. The noise from the drilling for the CIDH piles would not be measurable in the water. The distance to the creek from the west abutment piles would vary depending on the creek channel after the winter flows. The current construction plan is to construct a temporary dam approximately 20 feet upstream of the project and divert the creek, if there is any flow, into a pipe to discharge below the project area. The approximate distance used in the analysis were based from the pipe where the diverted creek would be placed, assuming the pipe will be in the center of the creek bed. Abutment 1 is positioned approximately 60 feet (18 meters) from the existing wetted portion of the creek and is about 10 feet above the water line. Construction is scheduled for summer and therefore, it is not expected that pile diving would occur at high water levels where the piles would be driven in the water.

Sounds from similar size steel shell piles have not been measured however, there have been measurements made of larger piles being driven near the water for several bridge projects. Data measured at the Ten Mile Bridge Replacement Project, included larger sized diameter steel shell piles being driven on land near a river. The difference in pile size would require a small adjustment in the source levels to compensate for the difference in the size of the piles. The Willits bypass project had slightly smaller piles which would also require an adjustment in the

[5] This calculation assumes that single strike SELs < 150 dB does not accumulate to cause injury (Effective Quiet). [2] SEL is currently not used in analysis of vibratory pile driving

Based on the calculations there will be no injury to fish from the proposed impact pile driving; however, regardless what technique is used to install the piles, there would be some harassment to fish if water is present in the channel during project construction. The primary sources of underwater sound would be from the impact driving of round steel piles to support abutment 1, the west abutment of the new bridge. All the piles would be driven outside of the creek channel. The bridge will be supported on pile groups at the two abutments consisting of sixteen (16) 45-

measured levels. A third project considered is the Orwood Bridge Replacement project, this project included the measurements of 20-inch steel shell piles driven in and near the water for the construction of a temporary trestle. The piles were approximately the same length as the ones proposed for this project and they were installed both with an impact hammer and vibratory hammer.

Ten Mile River Replacement Project

Measurement data from Pier 5 at the Ten Mile River Bridge Replacement project are most similar to the pile driving activities proposed for Abutment 1 at this project. The Ten Mile project included 30-inch diameter steel pipe piles to support the piers for the bridge. Pier 5 of the project was located on land with the closest portion about 60 feet (18 meters) from the edge of the estuary (see Figures 7a and 7b). Ten Mile River resembles more of a tidal estuary than a flowing river at the project site. Water depth is very shallow, less than 1 meter through out much of the river except the deepest parts where water depth can reach almost 2 meters during high tides. Underwater noise measurements during pile installation were made in waters that were 3 feet (1 meter) or deeper.

Pier 5 measurements for vibratory and impact driving were reviewed. At the closest in water position (3 feet or deeper), which was 125 feet (38 meters) from the pile, sound levels from impact pile driving were 172 dB peak and 163 dB RMS. SEL levels were not measured, but are estimated to be about 150 dB. Vibratory driving at this pier produced much lower sound levels of 130 to 142 dB Peak and 125 dB SEL for each second.

Willits Bypass Project

During the construction of the Willits Bypass project 14-inch steel shell piles were driven in the on land for the construction of the Haehl Bridge abutments. Measurements were taken at two locations as required by the monitoring plan. The first location was 35 meters upstream of the bridge and the second position was 60 meters downstream from the bridge. The levels measured at both positions are shown in ***Table 5***.

Table 5 – Measurement Data from Piles driven at the Willits Bypass Project and Orwood Bridge Replacement Project

Distance from Pile	Pile Size	Peak	RMS		One Second SEL		Measurement Location
		Maximum	Average	Range	Average	Range	
Diesel Impact Data							
35 meter	14-inch	170	146	136-151	134	121-139	Willits Bypass
Vibratory Pile Driving Data							
30 meter	30-inch	165[1]	147[1]	--	147[1]	--	10-mile River Bridge

[1] – Adjusted Data

Adjustment to Data

The Vibratory sound levels measured at the Ten Mile River project were adjusted down by 5 dB to compensate for the difference in pile sizes. The Ten Mile Project had 30-inch steel shell piles and the Hill Road Project pile sizes are 16-inch steel shell piles. The reduction was based on measurements of similar sized piles in the water. A 12-inch steel shell pile vibrated in has a peak level of 171 dB and a 36 inch steel shell pile has a peak level of 180 dB. There is a 9 dB peak levels and the larger pile has 3 times more surface area than the smaller pile. The difference is approximately 4.5 dB per equivalent size increase. The difference between the 30-inch piles at Ten Mile River and the 16-inch piles for this project is one doubling in size or the 16-inch pile would be approximately 4.5 dB quitter than the 30-inch piles, when the data is rounded off the Ten Mile River data was adjusted down by 5 dB. No adjustments were made for the 14-inch steel shell piles driven as part of the Willits Bypass project.

Prediction of Noise from Project Pile Driving

Pile driving is expected at the west abutment associated with the bridge. Noise impacts are discussed specifically for each area of pile driving. *Abutment 1- West Abutment*

Abutment 1 will have 16 steel pipe piles with a diameter of 16-inches (0.41 m) either installed with an impact hammer, vibratory hammer or combination of the two hammers. Abutment 2 will have 10 steel Cast in drilled hole (CIDH) pipe piles with a diameter of 24-inches (0.61 m) and the wing walls will be supported by an additional 12 24-inch CIDH piles. The CIDH pile will either be rotary drilled or boreholed in, there will be no impact or vibratory pile driving used at Abutment 2. For Abutment 1 three different scenarios were analyzed, as described above, ranging from impact or vibratory driving only to a combination of the two methods.

Impact Driving Results

These data indicate that no portion of the creek would receive single strike SEL's above 150 dB during the impact pile driving, therefore there would be no accumulation of the SEL's that would cause injury to fish in the creek. During the impact pile driving there would be portions of the creek about 115 feet (35 meters) from the piles that would have received levels of 150 dB RMS during impact pile installation. ***Figure 2*** shows the limits of the 150 dB fish harassment zone for impact pile driving, the exact limits of the harassment area will depend on the exact location of the stream during the proposed construction season. The aerial photo used for Figure 2 shows the stream bed as it was on May 30, 2014. Attachment 1 shows the calculations used to assess the impacts.

This assessment assumes that there would be 4,350 pile strikes per day at each abutment over a four- to five-day period. With the piles being driven on land, the single strike SEL is anticipated to be less than 150 dB re 1µPa and as such would not accumulate to cause injury to fish in the creek. There would be no exceedance of either the 187 dB or 183 dB re 1µPa^2-sec adopted cumulative SEL criteria and no mitigation would be required.

Vibratory Driving Results

Based on the location of the proposed temporary diversion dam, located at the edge of the area of proposed Archaeological Area of Potential Effects (APE) map provided, the sounds from vibratory installation would not have an injurious impact to the fish species. During the vibratory pile driving there would be portions of the creek about 75 feet (23 meters) from the piles that would have

received levels of 150 dB RMS during vibratory pile installation. ***Figure 2*** shows the limits of the 150 dB fish harassment zone for vibratory pile driving, the exact limits of the harassment area will depend on the exact location of the stream during the proposed construction season.

Figure 2 - Hill Road 150 dB RMS Fish Harassment Zone from Pile Driving.



Bridge Demolition

The following section will discuss the demolition of the existing bridge, which will be done all at one time while the roadway is closed and traffic detoured to other routes. To begin with, some assumptions were made regarding the methods used for the demolition of the bridge. The existing bridge deck is wooden. Therefore, concrete demolition would occur at the existing bridge abutments and wing walls. It is assumed that a small hoe ram will be used to demolish the bridge abutments and wing walls.

Use of Hoe Rams

At this time, there is little known about the underwater sound generated by the use of hoe rams and jack hammers in the demolition of bridges. Table 7 shows the measured levels of the abutment at the Mad River Bridge near Arcata, California. The abutment measured was approximately 27 meters from the wetted channel in the Mad River. It is unclear where the channel may be during the proposed construction period, however based on the current photo of Mill Creek the distance to the abutments appears to be between 6 and 21 meters. Based on the varying levels measured at the Mad River Bridge demolition it is difficult to determine an appropriate level to use in the assessment and an adjustment factor for the difference in the distances.

Table 7 – Summary of Pier Demolition Results

Pile Number	Distance Measured (m)	Hoe Ram Size	Peak	Average Peak	Average RMS	Average One-second SEL
9/18/12	27	5,800 ft. lbs.	176	154	147[1]	135

[1] – Estimated Not Measured.

Due to wide range in levels measured and the uncertainty as to the exact location of the Mill Creek it was determined not to make any adjustments in the measured data for the analysis of the demolition of Abutment 1 (west abutment) and Abutment 2 (east abutment). Rather the analysis assumes that the creek is located in the center of the creek bed, approximately 15 meters from either abutment and the maximum levels will be used to show the potential worst case scenario.

Because it is likely that there may be thousands of hoe ram strikes per day, the assumption was made that the injury area (defined as the 183 dB and 187 dB cumulative SEL) is within the distance to effective quiet, 150 dB re 1µPa SEL. Calculations for removing the bridge abutments, assuming the use of a small hoe ram and no attenuation, show that the single strike or one second SEL level of 150 dB would not be measured in the water column and therefore there would be no exceedance of either the 187dB or the 183 dB cumulative SEL threshold during the demolition of either of the abutments. The distance to the limits of the 150 dB fish harassment zone for the abutment demolition would be approximately 20 meters from each abutment, the exact limits of the harassment area will depend on the exact location of the stream during the proposed demolition.

Attachment 1

Hill Road Bridge															***Fish Thresholds***				
Location	Quantity	Diameter in inches	Estimated Pile Embedment Depth (feet)	Assumed depth to vibrate before hammer driving	Estimated Strikes/Piling	Strikes per foot	Strikes per minute (Approx.)	Piles Per Day	Peak Level	RMS Level	Single Strike SEL	Where data calculated from	Distance in Meters	Transmission Loss	Cumulative SEL	Distance to 187 dB Cumulative SEL Critera (m)	Distance to 183 dB Cumulative SEL Critera (m)	Distance to 150 dB RMS Critera (m)	Distance to 206 dB Peak Critera (m)
Abutment 1 - West																			
Impact Drive	16	16	45	45.0	5400	15	42	8	170	150	134	Willits	35	25	--[2]	--[2]	--[2]	35	<10
Vibratory Drive	16	16	45	45.0	2700			8	165	147	147	Ten mile	30	25	--[1]	--[1]	--[1]	23	<10
1/2 Impact Drive	16	16	45	23.0	2760	15	42	8	169	150	134	Willits	35	25	--[2]	--[2]	--[2]	35	<10
1/2 Vibratory drive	16	16	45	22.0	1320			8	165	147	147	Ten mile	30	25	--[1]	--[1]	--[1]	23	<10
Abutment 2 - East																			
Piles are CDIH piles and therre will be no ıile driving																			

--[1] No SEL Th eshhold for bratory pile driving

--[2] Single Stri ke SEL's less than 150 dB do not accumulate to cause inury to fish

DEMOLITION of EXIST /CTURE STR

								Blows per day	Peak Level	RMS Level	Single Strike SEL	Where data calculated from	Distance in Meters	Transmission Loss	Cumulative SEL	Distance to 187 dB Cumulative SEL Critera (m)	Distance to 183 dB Cumulative SEL Critera (m)	Distance to 150 dB RMS Critera (m)	Distance to 206 dB Peak Critera (m)
Abutment Removal	Assuming one Hoe Ram during olition							3500	176	147	135	Mad River	27	25	170	6	7	20	<10

	--	[2] Single Strike SEL's less than 150 dB do not accumulate to cause injury to fish																	

Appendix B

Noise and Vibration Assessment

HILL ROAD BRIDGE REPLACEMENT PROJECT CONSTRUCTION NOISE AND VIBRATION ASSESSMENT MENDOCINO COUNTY, CALIFORNIA

April 7, 2017

♦ ♦ ♦

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Introduction and Findings Summary

This report presents the results of the construction noise and vibration assessment completed for the Hill Road Bridge Replacement Project in Mendocino County, California. The proposed project would replace the existing single-lane bridge with a new two-lane bridge and widened roadway approaches. The report first presents the fundamentals of environmental noise and vibration for those who may not be familiar with acoustical terminology or concepts, then provides an evaluation of noise and vibration levels resulting from project construction activities. Measures to reduce construction noise levels are recommended.

Based on the analyses presented herein, it was found that project construction activities would result in short-term periods of elevated noise levels and ground vibration in the project vicinity. With the incorporation of the noise reduction measures included at the conclusion of the noise analysis, no significant construction impacts have been identified for this project. Also, this analysis found that vibration generated from construction activities would not exceed the 0.3 inch per second Peak Particle Velocity (in/sec PPV) threshold. Therefore, this impact is considered less than significant.

Fundamentals of Environmental Noise

Noise may be defined as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. The objectionable nature of sound could be caused by its pitch or its loudness. Pitch is the height or depth of a tone or sound, depending on the relative rapidity (*frequency*) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. Loudness is intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with the height of an ocean wave in that it is a measure of the amplitude of the sound wave. See Table 1 for a definition of all technical terms (identified with *italic* text) used in this report.

In addition to the concepts of pitch and loudness, there are several noise measurement scales which are used to describe noise in a particular location. A *decibel (dB)* is a unit of measurement which indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a ten-fold increase in acoustic energy, while 20 decibels is 100 times more intense, 30 decibels is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10 decibel increase in sound level is perceived as approximately a doubling of loudness over a fairly wide range of intensities.

There are several methods of characterizing sound. The most common in California is the *A-weighted sound level (dBA).* This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Representative outdoor and indoor noise levels in units of dBA are shown in Table 2. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying

events. This *energy-equivalent sound/noise descriptor* is called L_{eq}. The most common averaging period is hourly, but L_{eq} can describe any series of noise events of arbitrary duration.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends upon the distance the receptor is from the noise source. Close to the noise source, the models are accurate to within about plus or minus 1 to 2 dBA.

Since the sensitivity to noise increases during the evening and at night -- because excessive noise interferes with the ability to sleep -- 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The *Community Noise Equivalent Level (CNEL)* is a measure of the cumulative noise exposure in a community, with a 5 dB penalty added to evening (7:00 p.m. - 10:00 p.m.) and a 10 dB addition to nocturnal (10:00 p.m. - 7:00 a.m.) noise levels. The *Day/Night Average Sound Level (L_{dn} or DNL*) is essentially the same as CNEL, with the exception that the evening time period is dropped and all occurrences during this three-hour period are grouped into the daytime period.

Fundamentals of Groundborne Vibration

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One method is the *Peak Particle Velocity (PPV).* The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. In this report, a PPV descriptor with units of mm/sec or in/sec is used to evaluate construction generated vibration for building damage and human complaints. Table 3 displays the reactions of people and the effects on buildings that continuous vibration levels produce.

The annoyance levels shown in Table 3 should be interpreted with care since vibration may be found to be annoying at much lower levels than those shown, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage.

Construction activities can cause vibration that varies in intensity depending on several factors. The use of pile driving and vibratory compaction equipment typically generates the highest construction related groundborne vibration levels. Because of the impulsive nature of such activities, the use of the PPV descriptor has been routinely used to measure and assess groundborne vibration and almost exclusively to assess the potential of vibration to induce structural damage and the degree of annoyance for humans.

The two primary concerns with construction-induced vibration, the potential to damage a structure and the potential to interfere with the enjoyment of life, are evaluated against different vibration limits. Studies have shown that the threshold of perception for average persons is in the

range of 0.008 to 0.012 in/sec PPV. Human perception to vibration varies with the individual and is a function of physical setting and the type of vibration. Persons exposed to elevated ambient vibration levels, such as people in an urban environment, may tolerate a higher vibration level.

Structural damage can be classified as cosmetic only, such as minor cracking of building elements, or may threaten the integrity of the building. Safe vibration limits that can be applied to assess the potential for damaging a structure vary by researcher and there is no general consensus as to what amount of vibration may pose a threat for structural damage to the building. Construction-induced vibration that can be detrimental to the building is very rare and has only been observed in instances where the structure is at a high state of disrepair and the construction activity occurs immediately adjacent to the structure.

TABLE 1 Definition of Acoustical Terms Used in this Report

Term	Definition
Decibel, dB	A unit describing, the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20 micro Pascals.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micro Pascals (or 20 micro Newtons per square meter), where 1 Pascal is the pressure resulting from a force of 1 Newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g., 20 micro Pascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and Ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period.
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day/Night Noise Level, L_{dn} or DNL	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 p.m. and 7:00 a.m.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 p.m. to 10:00 p.m. and after addition of 10 decibels to sound levels measured in the night between 10:00 p.m. and 7:00 a.m.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Source: Handbook of Acoustical Measurements and Noise Control, Harris, 1998.

TABLE 2 Typical Noise Levels in the Environment

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110 dBA	Rock band
Jet fly-over at 1,000 feet		
	100 dBA	
Gas lawn mower at 3 feet		
	90 dBA	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	80 dBA	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	70 dBA	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	60 dBA	
		Large business office
Quiet urban daytime	50 dBA	Dishwasher in next room
Quiet urban nighttime	40 dBA	Theater, large conference room
Quiet suburban nighttime		
	30 dBA	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	20 dBA	
		Broadcast/recording studio
	10 dBA	
	0 dBA	

Source: Technical Noise Supplement to the Traffic Noise Analysis Protocol (TeNS), Caltrans, September 2013.

TABLE 3 Reaction of People and Damage to Buildings from Continuous or Frequent Intermittent Vibration Levels

Velocity Level, PPV (in/sec)	Human Reaction	Effect on Buildings
0.01	Barely perceptible	No effect
0.04	Distinctly perceptible	Vibration unlikely to cause damage of any type to any structure
0.08	Distinctly perceptible to strongly perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
0.1	Strongly perceptible	Virtually no risk of damage to normal buildings
0.3	Strongly perceptible to severe	Threshold at which there is a risk of damage to older residential dwellings such as plastered walls or ceilings
0.5	Severe - Vibrations considered unpleasant	Threshold at which there is a risk of damage to newer residential structures

Source: Transportation and Construction Vibration Guidance Manual, California Department of Transportation, September 2013.

Construction Noise Assessment

Description of Project Construction Activities

Construction is anticipated to begin in March 2019 and continue through November 2019. The project would be conducted during one construction season and take approximately 8 months to complete. The total construction disturbance area is estimated to be 1.23 acres.

Roadway Closure

The existing bridge crossing would be closed to vehicles throughout the duration of construction.

Bridge Demolition and Construction

Before the new bridge is constructed, the existing bridge would be dismantled. Construction equipment, including cranes, excavators, jack hammers, and shovels would be used to break-up and remove the existing concrete abutments, headwalls, and associated footings from the creek. Existing concrete piles would be cut below grade and left in place.

Demolition waste would be stockpiled and sorted outside of the creek channel and then loaded for disposal or recycling at appropriate off-site facilities.

A temporary access road would be constructed within the creek to accommodate construction, including pile driving and pouring of new concrete bridge abutments and headwalls. Steel pipe piles at each new bridge support would be driven below the potential scour line of the streambed of Mill Creek to a depth of up to 45 feet. Once the concrete is cured and the piles are in place, a crane would be used to set a new prefabricated steel structure in place. After the steel structure is

set in place, the reinforcing rebar for the deck and curb would be placed, and the concrete for the surface would be poured.

Dewatering

Construction activities within the banks of Mill Creek would be performed between June 15 and October 15, which would correspond to times when there is little or no precipitation and when stream flow would be lowest. If water is present in the channel, the flow would be diverted by placing a temporary dam upstream of the project and directing flow through a pipe to discharge below the project area. The length of the pipe would be the minimum necessary to safely convey the flow through the construction site, and would be placed on the streambed at natural grade. To allow for construction equipment and vehicles to cross over the pipe, clean river rock would be laid down and covered with impervious geofabric and placed over the pipe and the streambed. Then clean, washed, commercially available angular rock fill would be placed over the geofabric to sufficient depth to allow construction equipment passage. Once any upstream flow is diverted, any standing water within the construction area would be pumped out of the creek bed and discharged to the ground away from the stream to allow for infiltration into the ground. Upon project completion, the geofabric, angular rock, and diversion pipe would be removed from the channel, and the imported gravel would be spread out.

Revegetation

Construction would require removal of approximately 30 trees (alder, willow, and oaks), as well as grasses and shrubs. The majority of the trees to be removed have tree trunk diameters less than 4-inches wide, although four of the trees have diameters greater than 12-inches.

Once the new bridge and RSP is complete, exposed and disturbed areas of the creek bank and construction area would be seeded and mulched. Non-invasive plants would be used for revegetation along with commercial hydraulic mulching materials. Application quantities for mulching would be provided in accordance with the Caltrans Standard Specifications for erosion control.

Staging and Construction Workers

During construction, a temporary staging area would be established within the roadway on either side of the creek. The staging area would be used for delivery and storage of construction materials, for fueling and maintenance of equipment, and for contractor parking. The types of construction equipment that would likely be used during construction are listed in Table 4, Construction Equipment.

The number of construction-related vehicles traveling to and from the Project site would vary on a daily basis. For the purpose of analysis, it is assumed that the peak number of trucks expected on any one day would be approximately 8 one-way truck trips per hour, or 64 one-way haul truck trips per day. In addition to haul truck traffic, an average of 40 one-way vehicle trips per day is estimated for the construction crew.

TABLE 4 Construction Equipment

Typical Equipment	Number
Excavator	1
Front-end Loader	1
Bulldozer	1
Crane	1
Dump Trucks	1
Grader	1
Asphalt Paver	1
Rollers	1
Vibratory Pile Driver	1
Impact Pile Driver	1

Bridge Abutment Piles

The piles would be installed in approximately four to five days. At the east abutment and wing walls, there would be 22 steel pipe piles, 24" diameter x 30' deep, and be installed using cast-in-drilled-hole (CIDH) construction method, whereby a borehole is drilled into the ground and then filled with concrete and reinforcing. The west abutment would have 16" diameter pipe piles driven approximately 45-feet below ground surface. The west abutment wing walls/retaining walls may use 16-inch diameter pipe piles or 24-inch diameter CIDH piers. In total, it is assumed that sixteen (16) piles would be placed at the west abutment.

Regulatory Criteria

Mendocino County does not establish quantitative noise limits for construction activities.

Caltrans Standard Specification Section 14-8.02, "Noise Control," states the following:

- Control and monitor noise resulting from work activities.
- Do not exceed 86 dBA L_{max} at 50 feet from the job site from 9:00 p.m. to 6:00 a.m.

Construction Noise Levels

Noise generated by project-related construction activities would be a function of the noise levels generated by individual pieces of construction equipment, the type and amount of equipment operating at any given time, the timing and duration +of construction activities, the proximity of nearby sensitive land uses, and the presence or lack of shielding at these sensitive land uses. Construction noise levels would vary on a day-to-day basis during each phase of construction depending on the specific task being completed. Each construction phase would require a different combination of construction equipment necessary to complete the task and differing usage factors for such equipment. Construction noise would primarily result from the operation of heavy construction equipment and the arrival and departure of heavy-duty trucks. The highest maximum instantaneous noise levels would result from special impact tools.

FHWA's Roadway Construction Noise Model (RCNM) was used to calculate the maximum and average noise levels anticipated during each phase of construction. This construction noise model includes representative sound levels for the most common types of construction equipment and the approximate usage factors of such equipment that were developed based on an extensive database of information gathered during the construction of the Central Artery/Tunnel Project in Boston, Massachusetts (CA/T Project or "Big Dig"). The usage factors represent the percentage of time that the equipment would be operating at full power. Vehicles and equipment anticipated during each phase of construction were input into RCNM to calculate noise levels at a distance of 200 feet, the approximate distance from the construction site to the nearest residences to the northwest and south of the existing bridge. Other sensitive receptors in the project vicinity include residences to the north, east, and west located approximately 500 to 600 feet from the project site.

Demolition, earthwork, and structures would generate hourly average noise levels of 73 dBA L_{eq} at a distance of 200 feet. Maximum instantaneous noise levels would reach 73 dBA L_{max} at 200 feet. Construction generated noise levels drop off at a rate of about 6 dBA per doubling of distance between the source and receptor; therefore the noise levels calculated at 200 feet would be about 8 dBA less at 500 feet and 10 dBA less at 600 feet. Shielding provided by buildings or terrain would result in even lower construction noise levels at distant receptors.

The highest construction noise levels would occur during the installation of the bridge abutment piles, which would occur a period of approximately four to five days. Average noise levels during the pile installation phase, when utilizing a vibratory or impact hammer, would reach 82 dBA L_{eq} at a distance of 200 feet. Maximum instantaneous noise levels produced by a vibratory hammer or impact hammer would reach 89 dBA L_{max} at a distance of 200 feet. At a distance of 500 feet, noise levels would be approximately 74 dBA L_{eq} and 81 L_{max}. Pile driving noise levels would be approximately 72 dBA L_{eq} and 79 dBA L_{max} at a distance of 600 feet.

Construction-related vehicles traveling to and from the Project site would generate worst-hour noise levels of approximately 57 dBA L_{eq} at a distance of 50 feet from the center of Hill Road assuming that the peak number of trucks expected on any one day would be approximately 8 one-way truck trips per hour and that up to 20 one-way vehicle trips would occur per hour for the construction crew.

Construction Noise Reduction Measures

To reduce the potential for noise impacts resulting from project construction, the following measures should be implemented during project construction.

- Noise-generating construction activities should be restricted to the hours of 8:00 a.m. to 6:00 p.m. Monday through Friday. No construction activities should occur on weekends or holidays. If work is necessary outside of these hours, the County should require the contractor to implement a construction noise monitoring program and, if feasible, provide additional mitigation as necessary (in the form of noise control blankets or other temporary noise barriers, etc.) for affected receptors.

- Equip all internal combustion engine driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment.

- Unnecessary idling of internal combustion engines within 100 feet of residences should be strictly prohibited.

- Locate stationary noise generating equipment as far as possible from sensitive receptors when sensitive receptors adjoin or are near a construction project area.

- Utilize "quiet" air compressors and other "quiet" equipment where such technology exists.

- The contractor should prepare a detailed construction plan identifying the schedule for major noise-generating construction activities and distribute this plan to adjacent noise-sensitive receptors. The construction plan should also list the construction noise reduction measures identified in this study.

Construction Vibration Assessment

For structural damage, the California Department of Transportation uses a vibration limit of 0. 5 inches/second, peak particle velocity (in/sec, PPV) for buildings structurally sound and designed to modern engineering standards, 0.3 in/sec, PPV for older residential buildings, 0.25 for historic and some old buildings, and a conservative limit of 0.08 in/sec, PPV for ancient buildings or buildings that are documented to be structurally weakened. All buildings in the project vicinity are assumed to be structurally sound, but these buildings may or may not have been designed to modern engineering standards. No ancient buildings or buildings that are documented to be structurally weakened are known to exist in the area.

Table 5 presents typical vibration levels that could be expected from construction equipment at a distance of 25 feet. A review of the vibration source level data indicates that vibration levels expected from project construction activities would typically range from 0.003 in/sec PPV to 0.210 in/sec PPV at a distance of 25 feet from the source for the vast majority of proposed construction activities. During pile driving, vibration levels typically range from 0.170 in/sec PPV to 1.158 in/sec PPV at a distance of 25 feet. Vibration levels are highest close to the source, and then attenuate with increasing distance at the rate (Dref/D)1. 1, where D is the distance from the source in feet and Dref is the reference distance of 25 feet. The nearest residences are approximately 200 feet from the construction site, and vibration levels at this distance would be 0.1 in/sec PPV or less and would not exceed the 0.3 in/sec PPV threshold.

TABLE 5 Vibration Source Levels for Construction Equipment

Equipment		PPV at 25 ft. (in/sec)	PPV at 200 ft. (in/sec)
Pile Driver (Impact)	upper range	1.158	0.118
	typical	0.644	0.065
Pile Driver (Sonic)	upper range	0.734	0.075
	typical	0.170	0.017
Clam shovel drop		0.202	0.021
Hydromill (slurry wall)	in soil	0.008	0.001
	in rock	0.017	0.002
Vibratory Roller		0.210	0.021
Hoe Ram		0.089	0.009
Large bulldozer		0.089	0.009
Caisson drilling		0.089	0.009
Loaded trucks		0.076	0.008
Jackhammer		0.035	0.004
Small bulldozer		0.003	0.000

Source: Transit Noise and Vibration Impact Assessment, United States Department of Transportation, Federal Transit Agency, Office of Planning and Environment, May 2006.

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