

**Richardson Grove**

**NES (MI)**

# Natural Environment Study

Route 101 Richardson Grove  
Widening and Resurfacing Humboldt County

01-HUM-101-PM 1.1/2.2

01-46480

**December 2008**

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## Summary of Findings and Conclusions

This document is intended to provide information about the natural environment and the species present in the vicinity of Richardson Grove on Route 101 in Humboldt County. The project area will include 1.1 miles of Route 101 between Post Miles 1.1 and 2.2 in and around Richardson Grove State Park (Appendix A). This Natural Environment Study (NES) evaluates potential impacts of the proposed project. The purpose and need of this work is to widen the roadway to accommodate STAA (Surface Transportation Assistance Act of 1982) trucks. STAA trucks are longer than California legal trucks and have a larger turning radius. Consequently, they require more gradual curves to avoid off-tracking. Off-tracking is a result of a turning movement where the rear tires follow a shorter tracking path than the front tires. Off-tracking may cause the vehicle to knock down signs, encroach onto shoulders, or cross into the opposing/adjacent lane of traffic to accommodate to the roadway. The project will involve ground disturbance, slope excavation, a retaining wall, culvert work, temporary stream diversion, a seasonal construction window, disposal/barrow sites, equipment staging areas, utility relocation, permanent right-of-way acquisition, temporary construction easements, as well as vegetation and tree removal.

Avoidance and minimization measures will be employed so the action will have no adverse impact on sensitive biological resources, natural communities of special concern, special status plant species, and special status animal species. Potential impacts to special status species have been analyzed based upon habitat present, record searches, site surveys, and information provided by the U.S. Fish and Wildlife Service, NOAA Fisheries, and the California Department of Fish and Game. Although there is habitat for a number of special status species in the project vicinity, this work will not adversely impact those species or their habitat. For listed fish species, the project is not expected to result in any cumulative adverse impacts to available spawning or rearing habitat, essential fish habitat, and will not result in adverse modification of coho salmon (*Oncorhynchus kisutch*), chinook salmon (*Oncorhynchus tshawytscha*), or steelhead trout (*Oncorhynchus mykiss*) designated critical habitat.

The project site is within the breeding range of the state listed peregrine falcon (*Falco peregrinus*); as well as the federally listed northern spotted owl (*Strix occidentalis caurina*) and marbled murrelet (*Brachyramphus marmoratus*) –also state listed. There is suitable nesting habitat for some of these birds within ¼ mile of the project locations. However, this project will not adversely modify any critical habitat for any of these species. Nor will it impact rearing or foraging habitat. Some marginal northern spotted owl dispersal and foraging habitat will be impacted. The federal candidate species Pacific fisher (*Martes pennanti*) is also found near the project area. This work will not adversely impact Pacific fisher or its habitat.

Additional sensitive bird, amphibian, invertebrate, and plant species inhabit the project area. Measures will be included in the design and construction techniques to avoid or minimize direct, indirect, and/or cumulative impacts to these species.

The noise of construction is not expected to exceed ambient traffic noise (Appendix E). Noisy equipment will include jack hammering, concrete sawing, and concrete grinding as well as the back-up warning signal on heavy equipment. To avoid impacting nesting migratory birds, any tree and shrub removal will also take place outside of the bird breeding season. The bird breeding season is March 1 to September 1.

Areas rare or sensitive plant species may occur close to construction areas in the Environmental Study Limits (ESL) will be designated as environmentally sensitive areas (ESAs). Temporary fencing will be placed 2 feet from the plant population to protect these resources during construction.

Although there are no three-parameter wetlands in the project area, there are jurisdictional Waters of the U. S. Temporary and minor permanent impacts to jurisdictional watercourses associated with the proposed action will require a Nationwide Permit issued by the U.S. Army Corps of Engineers under Section 404 of the federal Clean Water Act and a Water Quality Certification from the Regional Water Quality Control Board under Section 401 of the Clean Water Act. A Lake and Streambed Alteration Agreement will be required from the Department of Fish and Game.

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## List of Abbreviated Terms

BMP	Best Management Practices
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CNDDB	California Natural Diversity Database
Corvid	Crow, raven, and jay
DFG	California Department of Fish and Game
DBH	Diameter at Breast Height
NEPA	National Environmental Policy Act
NES	Natural Environment Study
MAMU	Marbled Murrelet
NSO	Northern Spotted Owl
PCE	Primary Constituent Element
PM	Post Mile
SSP	Standard Special Provisions
STAA	Surface Transportation Assistance Act of 1982
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service

## Chapter 1. Introduction

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### 1.1. Project Purpose and Need

The purpose and need of this work is to widen the roadway to accommodate STAA (Surface Transportation Assistance Act of 1982) trucks. STAA trucks are longer than California legal trucks and have a larger turning radius. The project will involve ground disturbance, slope excavation, construction of a retaining wall, culvert work, potential temporary stream diversion, night work, disposal/barrow sites, equipment staging areas, utility relocation, permanent right-of-way acquisition, temporary construction easements, repaving, as well as vegetation and tree removal. Future projects to maintain/rehabilitate the road surfaces or other safety-related projects will continue on a case-by-case basis.

### 1.2. Project Description

Caltrans plans to realign sections of the Route 101 Roadway in Humboldt County between Post Miles 1.1 and 2.2 in and around Richardson Grove State Park (Appendix B). The project will involve ground disturbance, areas of cut and fill, culvert work, potential temporary watercourse diversion, a seasonal construction window, placement a 300-foot long retaining wall, disposal/barrow sites, equipment staging areas, paving, utility relocation, permanent right-of-way acquisition, temporary construction easements, subsurface drainage easements, as well as vegetation and tree removal (Appendix C).

#### Cut and Fill

Main Slope Cuts on the western shoulder:

PM 1.35 to PM 1.36- Approx. 300 Cubic Yards (CY), 1500 sq. ft.

PM 2.05 to PM 2.10-Approx. 2200 CY, 4500 sq. ft.

PM 2.1 to PM 2.2 – Approx 900 CY, 5000 sq. ft. (retaining wall)

Main Areas of Fill:

PM 1.37 to PM 1.39- Approx 200 CY (eastern shoulder)

PM 1.56 to PM 1.61-Approx 200 CY (western shoulder)

Main Area of Cut and Fill on the eastern shoulder:  
PM 1.65 to PM 1.75-Approx 30 CY cut/40 CY fill

### Culvert Work

B. Culvert Work -- Four 18-inch diameter culverts and one 24-inch diameter culvert will be lengthened (diagrams--Appendix B). No tree removal is required for the culvert work. If stream diversion is required, measures will be employed to minimize sediment discharge. There would be some lengthening at the inlets and the outlets, and inlet structures will be installed. At some of the locations, the culvert will be lined with a flexible plastic Cast In Place Pipe (CIPP) Liner made from thermosetting resin. The liner is placed in the pipe and filled with hot air to expand the liner to conform to the insides of the pipe and activate the resin to set up. These Corrugated Steel Pipe (CSP) culverts will be modified as described below:

- PM 1.18 – This is an 18-inch diameter CSP that crosses Route 101 at a slight skew and passes near the buried base of a 7.5-foot diameter redwood. The down stream invert is perforated causing erosion of the slope below the pipe. The upstream portion will be extended approximately three feet. A new inlet and a CIPP liner will be installed in the existing culvert.
- PM 1.28 – This is an 18-inch diameter CSP with about 2 feet of existing pipe cover and a corroded invert. The failing culvert will be replaced with a new 24” pipe along the existing alignment. The upstream portion will be extended approximately three feet and new inlet will be installed.
- PM 1.34 – This is an 18-inch CSP with about one foot of existing pipe cover. The invert is corroded and perforated. A CIPP liner will be installed in the existing culvert and the upstream portion will be extended approximately three feet.
- PM 1.35 – This is an 18-inch CSP with 3.5 to 2.5 feet of existing pipe cover. The invert is corroded and perforated. The failing culvert will be replaced with a new 24-inch pipe along the existing pipe alignment and the upstream portion will be extended approximately five feet.
- PM 1.78 –This location has a 48” CSP which was recently slip-lined and had a new down drain with rock energy dissipater installed. The culvert is operating properly and is in good condition. However, roadside runoff is released to the stream by a gap in an earthen berm south of the culvert. The runoff flows over a steep (>1:1) fill slope to the

creek. The location was identified by California Department of Fish and Game as a concern for sediment generation potential. To prevent erosion, Caltrans will extend the existing berm across the drainage flow path to divert water to a new 12-inch diameter CSP downdrain located directly above and connected to the existing 48-inch diameter culvert.

- PM 2.10 -- This is a 24-inch diameter CSP with about 3.5 to 5 feet of existing pipe cover. The pipe inlet is about 3 feet from the edge of traveled way. The invert of the culvert is corroded. A 1-1/4inch diameter PVC water line passes through the culvert from the west side of Route 101. At present, vicinity roadway drainage is flowing in an uncontrolled manner through a gap in an AC dike over a fill slope to an existing swale. The upstream portion will be extended one to three feet. The failing culvert will be replaced with a new 24" pipe along the existing alignment. A conduit will be installed in the trench next to the new culvert to provide a separate accommodation for the private water line. Rock (as an energy dissipater) will be placed on the slope at the outlet to prevent erosion.

#### Tree and Shrub Removal.

Up to 88 trees – including about 49 tanoak, 28 Douglas-fir, 7 small redwood, 4 trees of various other species (Appendix C), and a number understory shrubs (mostly huckleberry and sword fern) will be removed from approximately ¼ acre of cuts and fills for this project. This vegetation will be removed between September 30 and March 1 to avoid impacts to federally listed and sensitive species. The majority of the disturbed area will be replanted in kind.

#### Night Work

To minimize traffic delays during peak travel hours there may be some night work as well as day work. For night work, lighting will be directed downward toward the work area to avoid disturbance to foraging northern spotted owls (*Strix occidentalis caurina*).

#### Contractor Staging Areas

Contractor stockpiling, equipment storage, and staging areas will be on the paved roadway and gravel shoulders. The contractor may arrange additional staging and storage areas on nearby parkland or private property.

#### Disposal of Excess Material

Excess material will be transported for off-site disposal. Some of the excess material from the slope cuts may be used for fill material within the Project Area.

December 4, 2008

Equipment

Loader, excavator, small crane, backhoe, grader, soldier pile auger, light plant, chainsaw, compressor, jackhammer, rock wheel, pavement saw, grinder, paver, cement truck, 10-wheel dump truck, and belly dump would likely be used.

The estimated order of work would be as follows

1. September 30 through March 1 -- Tree and shrub removal.
2. February 1 through July 1 – excavate slope and construct retaining wall
3. February 1 through September – cut and fill other areas
4. June 1 through October 15 – Culvert work
5. September through October -- Paving

## Chapter 2. Study Methods

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### 2.1. Regulatory Requirements

On September 17, 2007, Ray Bosch and Bill McIver of USFWS visited the site. Later it was determined that formal Section 7 Consultation with USFWS would be initiated for impacts to listed species and critical habitat. A Floristic Survey was conducted on July 26, 2007 by the project biologist (Gail Popham) and a Caltrans botanist (Kimberly Hayler). No federally listed plant species were found. One rare plant population was found. In compliance with CEQA, a consistency determination for impacts to marbled murrelet is required under Section 2080.1 of the Fish and Game Code. Therefore, consultation with CFG was initiated. On May 8, 2008 DFG Environmental Scientists Michael Van Hattem and Scott Bauer visit the site. An EIR (CEQA) and an Environmental Assessment (NEPA) are being prepared for the project.

### 2.2. Personnel and Survey Dates

Information in this report is based on field observations by a Caltrans Associate Environmental Planners (Natural Science), consultation with the California Department of Fish and Game (DFG), US Fish and Wildlife Service (USFWS), and a review of existing literature. A query of the California Natural Diversity Database (CNDDDB) was conducted for the project area and several special status species were reported to have occurred near the project area. The CNDDDB does not provide specific locations, but it is assumed that if habitat for the species exists, it will be present. The CNPS Inventory of Rare and Endangered Plants Database 9-Quad search was used to determine rare plants that might be in the project vicinity. Floristic surveys were conducted by a Caltrans biologist, Gail Popham in October and July 2007 and February and May 2008; and by a Caltrans botanist, Kim Hayler in July 2007 (Appendix F).

### 2.3. Agency Coordination

Permits/waivers required for this project include 1602 Lake and Streambed Alteration Agreement from the Department of Fish and Game, Section 404 Nationwide Permit from the U.S. Army Corps of Engineers, and a 401 Water Quality Certification from the Regional Water Quality Control Board. Caltrans is working with California Department of Parks and Recreation to install corvid proof trash containers in Richardson Grove State Park.

## Chapter 3. **Results: Biological Resources Present**

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### **3.1. Description of the Existing Biological and Physical Conditions**

The project area is in the Coastal Franciscan Ecological subsection. This subsection is a steep mountainous area of the northern California Coast Ranges south from Humboldt Bay to the Russian River. There is substantial oceanic influence on climate, including summer fog.

Geography. The terrain in the project area consists of mountains with rounded ridges, steep and moderately steep sides, and narrow canyons. There are small areas of alluvium along the South Fork Eel River. Fluvial erosion and mass wasting are the primary geomorphic processes. The elevation of the project area is about 500 feet.

Soils. The soils have high content of plant material in the upper layer with marine sediments below. The soils are leached free of carbonates, and some older soils are strongly acid. Soil moisture regimes in the project area are predominantly xeric (dry) or at least dry during the summer months.

Vegetation. The predominant natural plant community in the project area is the Redwood series. The overstory of the vegetation community at this site is dominated by large redwood trees (*Sequoia sempervirens*), also present are Douglas-fir (*Pseudotsuga menziesii*), madrone (*Arbutus menziesii*), tan oak (*Lithocarpus densiflorus*), California bay (*Umbellularia californica*), and big leaf maple (*Acer macrophyllum*). Brush/sapling understory includes poison oak (*Toxicodendron diversilobum*), madrone, live oak (*Quercus chrysolepis*), manzanita (*Arctostaphylos spp.*), and tan oak. Ground vegetation in this area is evergreen huckleberry (*Vaccinium ovatum*), salal (*Gaultheria shallon*), licorice fern (*Polypodium glycyrrhiza*), sword fern (*Polystichum minitum*), gold-back fern (*Pentagramma triangularis*), red larkspur (*Delphinium nudicaule*), California fawn lily (*Erythronium californicum*), and woodland star (*Lithophragma spp.*).

Invasive Plant Species. French broom (*Genista monspessulana*) is an exotic invasive species. It can be found along the highway corridor throughout Richardson Grove. Himalayan blackberry (*Rubus discolor*) and yellow star thistle (*Centaurea solstitialis*) are also invasive exotics present within the project limits. A number of common exotic grass and herb species can also be found along the highway shoulders in Richardson Grove.

Climate. The mean annual precipitation is about 40 to 110 inches. Most is rain at lower elevations and some is snow at higher elevations. Mean annual temperature is about 40° to 53° F. The mean freeze-free period is about 225 to 300 days.

Surface Water. Runoff is rapid and many of the smaller streams are dry by the end of the summer. Natural lakes are absent.

The headwaters of the South Fork Eel River is at Cahto Peak near Laytonville in Mendocino County. From there it flows to its confluence with the mainstem Eel River near Weott in Humboldt County. The river flows mainly from south to north and is approximately 105 miles long. South Fork Eel Basin drains 689 square miles. Elevations within the basin range from 100 feet at the confluence with the Eel River to 4,491 feet at the headwaters at Iron Peak.

The predominant land uses throughout the basin are timber harvest, livestock grazing, and dispersed rural development. Approximately 80% of the basin is privately owned. Highway 101 runs along much of the South Fork Eel River and provides a major thoroughfare for travel.

The South Fork Eel River from its confluence with the mainstem to the Section Four Creek confluence in Mendocino County is designated as a Wild and Scenic River. The section of the river in the section of the river in the project area is designated as "recreational." The basin supports runs of coho salmon (*Oncorhynchus kisutch*) and steelhead trout (*O. mykiss*), and Chinook salmon (*O. tshawytscha*).

Three named watercourses cross Rte 101 within the project limits. This project will not involve any work in these streams.

*PM 1.62, Durphy Creek.* This perennial stream supports Coho salmon, Chinook salmon, and Steelhead trout. It flows 2.4 miles from its headwaters northwest of Richardson Grove at an elevation of 1418 feet to its confluence with the South Fork Eel River at an elevation of 594 feet in Richardson Grove. Durphy Creek drains an area of about 2.15 square miles. Durphy Creek flows through a 5 feet-high by 10 feet-wide concrete box culvert under Route 101 in Richardson Grove.

*PM 1.78, North Creek.* This seasonal stream supports CDFG Species of Concern yellow-legged frog (*Rana boylei*). North Creek flows 0.7 miles from its headwaters west of Richardson Grove at an elevation of about 1278 feet to its confluence with the South Fork Eel River at an elevation of about 560 feet in Richardson Grove. North Creek drains an area of about 115 acres. This creek flows through a culvert under Route 101.

*PM 1.98, Laurel Creek.* This seasonal stream is about 3471 feet long as it flows from its headwaters west of Richardson Grove at an elevation of 1260 feet to its confluence with the South Fork Eel River at an elevation of about 457 feet in Richardson Grove. Laurel Creek drains an area of about 127 acres. This creek flows through a culvert under Route 101.

### 3.2. Special Status Species in Project Area

#### Rare Plant Species

The project location is in the Garberville USGS 7.5 Minute Quadrangle. The other eight adjacent quadrangles are Piercy, Bear Harbor, Fort Seward, Harris, Noble Butte, Miranda, Ettersburg, and Briceland (9-Quad Area). Although the CNPS Inventory of Rare and Endangered Plants shows a number of rare plants in the 9-Quad Area, floristic surveys conducted on July 26, 2007 found only one rare plant population in the project limits (Appendix G). This population of sticky pea (*Lathyrus glandulosus*) is CNPS List Ranked 4.3 (Limited distribution in CA, watch list; not very endangered in CA); State Rank S3.3 (21-80 occurrences or 3,000-10,000 individuals, or 10,000-50,000 acres); Global Rank G3 (same definition as for State Rank). It is only known to occur in Humboldt & Mendocino Counties and is endemic to California (not found anywhere else in the world). This occurrence is in the middle of the species' range. These plants will be protected by temporary fencing and will not be impacted by project work. No additional rare or listed plant species were found in the project limits.

#### Special Status Animal Species

The CNDDDB shows a number of special status animal species 9-Quad Area (Appendix G). Richardson Grove contains habitat elements for the species listed below. However, this project activity will have no substantial impact on these species or their habitats.

***Androzous pallidus*, Pallid bat** -- The pallid bat is a California Department of Fish and Game Species of Concern. There is a historical record of an individual bat collected in Richardson Grove in 1936 (CNDDDB 2007). This species can be found in deserts, grasslands, shrublands, woodlands, and forests. Most common in open, dry habitats with rocky areas for roosting, the pallid bat is very sensitive to disturbance of roosting sites. Although the large trees in Richardson Grove may provide suitable roosting habitat, these trees will not be impacted by this project. The noise and activity disturbance generated by the construction of this project will not substantially exceed the existing disturbance levels. If night work is required, the lighting will be directed downward toward the roadway and will not substantially exceed the

level of disturbance of the existing traffic headlights. Therefore, this project will not adversely impact pallid bats or their habitat.

***Myotis yumanensis*, Yuma myotis and *Myotis californicus*, California Myotis bats** -- These bat species are common and widespread in California. They hibernate in the winter, making short migrations from summer areas to suitable hibernacula. During the warm months, they begin foraging for insects around dusk. Peak feeding activity for this species is 1-2.5 hours after sunset. In Richardson Grove, a 132" DBH, hollow redwood tree about 25 feet from the edge of the roadway near PM 1.49 (STA 79+20) provides a maternity roost for a colony of Yuma myotis. Here, female bats each give birth to a single pup from May to July. The young bats are dependant on their mothers for their first six weeks. If overly disturbed, the mother bats may abandon the roost. The tree's use by bats is public knowledge. It is fenced to discourage close proximity disturbance. To avoid excessive disturbance to this maternity roost during the time when dependent pups are likely to be present, there will be no light plants within 100 feet of the roost tree (PM 1.48-1.52, STA 78+20 to 80+20) during any night construction. Due to high daytime traffic levels, paving will be done at night. However, the additional lighting mounted on the paving equipment will not substantially exceed the level of disturbance of the existing traffic headlights. Excavation and cold planing will be done on the roadway within 25 feet of the roost tree prior to repaving. Excavation, cold planing, paving, and construction equipment activities will take place within 100 feet of the roost tree for no more than 2-3 hours for a period of 3-4 days. Therefore, this project is not likely to adversely impact these bats or their habitat.

***Martes pennanti pacifica*, Pacific fisher** – This species is a federal candidate for listing and a California Department of Fish and Game Species of Concern. The fisher requires intermediate to large-tree stages of coniferous forests & deciduous-riparian areas with high percent canopy closure. They require large areas of mature, dense forest. Although Richardson Grove may provide some suitable elements of Pacific fisher habitat, the noise and activity disturbance generated the current levels of human activity in this area make it low value as fisher habitat. The approximately ¼ acre of tanoak-dominated woodlands that will be cleared for cut-and-fill for this project are suitable as Pacific fisher dispersal and foraging habitat. Most of this area will be replanted in kind, and an additional 1/2 acre of degraded habitat in the park boundary will be recontoured, planted, and restored. The additional construction disturbance of this project will not substantially exceed the existing disturbance levels. If night work is required, the lighting will be directed downward toward the roadway and will not substantially exceed the level of disturbance of the existing traffic headlights. Therefore, this project will not adversely impact Pacific fishers or their habitat.

***Brachyrampus marmoratus*, Marbled murrelet** – A federally and state threatened species, the marbled murrelet nests in mature Douglas-fir and redwood forest within 35 miles of the ocean. The project area is within Designated Critical Habitat for this species. Although the project will not remove any large trees, these mature redwood trees in Richardson Grove are suitable for MAMU nesting. Measures will be implemented to prevent root impacts to large redwood trees. The noise and activity disturbance generated by the construction of this project will not substantially exceed the existing disturbance levels. However, the temporary noise, night work, and activity associated with project construction, is likely to disturb murrelets that are nesting in the area. The project will not adversely modify MAMU Critical Habitat.

***Haliaeetus leucocephalus*, Bald eagle** – Bald eagles are state listed. They nest and roost in large diameter trees or snags near large water bodies where prey is abundant. Although the large trees in Richardson Grove may provide some elements of suitable bald eagle habitat, these trees will not be impacted by this project. The noise and activity disturbance generated by the construction of this project will not substantially exceed the existing disturbance levels. If night work is required, the lighting will be directed downward toward the roadway and will not substantially exceed the level of disturbance of the existing traffic headlights. Therefore, this project will not adversely impact bald eagles or their habitat.

***Pandion haliaetus*, Osprey** -- A California Department of Fish and Game Species of Concern, the osprey can be found near ocean shores, bays, fresh-water lakes, and larger streams. They build large nests built in treetops within 15 miles of good fish-producing bodies of water. There is an active osprey nest in Richardson Grove about 100 feet east of Route 101 at PM 1.9 (east of the state Park Maintenance shop [pers. communication, Tim Wallace, Park Ranger]) This nest is outside the project limits. The noise and activity disturbance generated by the construction of this project will not substantially exceed the existing disturbance levels. If night work is required, the lighting will be directed downward toward the roadway and will not substantially exceed the level of disturbance of the existing traffic headlights. Therefore, this project will not adversely impact ospreys or their habitat.

***Strix occidentalis caurina*, Northern spotted owl** -- Federally listed as threatened, the Northern spotted owl (NSO) inhabits mature forests, with large conifers, and wooded canyons. The project area is not within proposed or designated critical habitat for this species. The project area has some elements of habitat suitable for the NSO. However, the trees that will be impacted by this project are at edges of stands, have less than 60% canopy cover, are adjacent to the highway, and have low value for owl nesting habitat. The approximately ¼ acre of tanoak-dominated woodlands that will be cleared for cut-and-fill for this project are suitable as NSO dispersal and foraging habitat. Their quality, as such, however, is reduced by close

proximity to the highway, businesses, residences, and campgrounds. Nonetheless, these areas will be replanted in kind. If night work is required, the lighting will be directed downward toward the roadway and will not substantially exceed the level of disturbance of the existing traffic headlights. Although there are currently no known NSO nest sites within ¼ mile of the project area, there is suitable nesting habitat closer to the project site. If owls were to nest closer, the temporary noise, night work, and activity associated with project construction, may disturb them.

***Actinemys marmorata*, Western Pond Turtle** -- A California Department of Fish and Game Species of Concern, the western pond turtle has been found in the South Fork Eel River and its tributaries in the vicinity of Richardson Grove State Park. These turtles can be found in permanent or semi-permanent freshwater aquatic habitats. During the spring or early summer, female pond turtles lay eggs in depressions they dig in sandy banks or on moist stream banks. Nest sites are typically within about 300 feet of a stream (Nussbaum et al. [1983]).

All of the culvert work in this project involves small, seasonal drainages-- unsuitable habitat for pond turtles. However, the southern 1/4-mile of the project area is within 300 feet of the South Fork Eel River. In this area, two culverts, PM 1.28 (outlets about 150 feet from the river) and PM 1.35 (outlets about 300 feet from the river) will be replaced. This will involve some excavation on the river side of Route 101. Female pond turtles could build nests in this area. However, there will be minimal heavy equipment work on the river side of the roadway. Any trenching for culvert replacement will be done from the paved roadway. Any impact to pond turtles will be minor and temporary. The additional noise and activity associated with this project will not substantially exceed the existing levels. This project will not adversely impact the Western pond turtles or their habitat.

***Rana boylei*, Foothill yellow-legged frog** -- A California Department of Fish and Game Species of Concern, the foothill yellow-legged frog can be found in partly shaded, shallow streams & riffles with a rocky substrate in a variety of habitats. These frogs require cobble-sized substrate for egg laying. The CNDDDB shows a 2005 observation of foothill yellow-legged frogs in North Creek within Richardson Grove State Park just west Rte 101. North Creek flows through a 48" culvert under Route 101 at PM 1.78 within the project limits. Work was recently completed on this culvert. This project is planning no additional work on North Creek. There will be some work on the roadway shoulders adjacent to the culvert to control erosion. This work will not adversely impact the foothill yellow-legged frog or its habitat.

***Rhyacotriton variegatus*, Southern torrent salamander** – Inhabiting coastal redwood, Douglas-fir, mixed conifer, montane riparian, and montane hardwood-conifer habitats, and old

growth forest in cold, well-shaded, permanent streams and seepages, the southern torrent salamander is a California Department of Fish and Game Species of Concern. The areas near the inlets/outlets of the four 18-inch diameter culverts that are being lengthened may have habitat suitable for southern torrent salamanders (diagrams- Appendix B). However, the disturbance at these areas will be less than 500 square feet at each culvert and the outlets will be returned to their original contours. There will be negligible permanent habitat disturbance. The outlet of the culvert at PM 1.18 is perched on a steep slope and allows salamanders to move downstream only. This will not change; it will allow only one-way mobility. The culvert at PM 1.28 will be replaced. It will outlet at grade as it does now, so will not be a barrier to salamander mobility. The third culvert, at PM 1.34 will be fitted with a plastic liner; its outlet is (and will remain) perched about one foot making it difficult for salamanders to move upstream. The outlet of the culvert at PM 1.35 will be replaced. It will (and currently does) outlet at grade so it will not be a barrier to salamander mobility. Any additional impact to southern torrent salamander will be minor and temporary.

***Oncorhynchus mykiss*, Northern California steelhead**-- Federally listed as threatened and a California Department of Fish and Game Species of Concern, the Northern California steelhead spends its adult life in the Pacific Ocean, but spawns in coastal streams and rivers, over gravel beds. There is suitable habitat present for this species in Durphy Creek, which flows through a concrete box culvert under Route 101 within the project limits. No work will be done within the bed, on the bank or in the channel of Durphy Creek. No riparian vegetation will be removed. Therefore, this project will not adversely impact northern California steelhead or their habitat.

***Oncorhynchus kisutch*, Coho Salmon**—Federally and state listed as threatened, the Northern California Coho salmon spends its adult life in the Pacific Ocean, but spawns in coastal streams and rivers, over gravel beds. There is suitable habitat present for this species in Durphy Creek, which flows through a concrete box culvert under Route 101 within the project limits. No work will be done within the bed, on the bank or in the channel of Durphy Creek. No riparian vegetation will be removed. Therefore, this project will not adversely impact northern California Coho salmon or their habitat.

***Oncorhynchus tshawytscha*, Chinook Salmon**—Federally listed as threatened the California Coastal Chinook salmon spends its adult life in the Pacific Ocean, but spawns in coastal streams and rivers, over gravel beds. There is suitable habitat present for this species in Durphy Creek, which flows through a concrete box culvert under Route 101 within the project limits. No work will be done within the bed, on the bank or in the channel of Durphy Creek. No riparian vegetation will be removed. Therefore, this project will not adversely impact

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Chinook salmon or their habitat.



## Chapter 4. **Project Impacts**

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### **4.1. Construction Noise**

The noise of construction is not expected to substantially exceed ambient traffic noise (traffic background noise; Appendix E). Noisy equipment will include jack hammers, concrete saws, and concrete grinders as well as the back-up warning signal on heavy equipment. Because the project area already experiences high noise level from vehicular traffic. The additional noise of construction noise will have no impact on breeding birds in the project area.

### **4.2. Construction Activity**

Richardson Grove State Park has year-round campgrounds and foot trails, and is subject to a high level of vehicle and pedestrian traffic. The construction work for this project will not substantially increase activity in the park. Therefore, there will be no effect to special status species due to increased human activity levels.

### **4.3. Tree Removal**

Approximately  $\frac{1}{4}$  acre of tanoak-dominated woodlands will be cleared for cut-and-fill for this project. These tanoak woodlands are NSO dispersal and foraging habitat and constitute one of the Primary Constituent Elements (PCEs) of MAMU Critical Habitat. Their quality as such, however, is reduced by close proximity to the highway, businesses, residences, and campgrounds. Although much of this area will be replanted in kind, there will be permanent habitat loss from the 300-foot long slope cut at the retaining wall. There will be temporal habitat loss in areas that are replanted since it may take ten years or more for the trees to reach the size of the ones that are going to be removed. Approximately 89 trees will be removed. Over half of these are tanoaks, followed in abundance by Douglas-firs with diameter at breast height (diameter measured at 4.5 feet above ground line [DBH]) ranging from 5 inches to 24 inches), redwoods (with DBH's ranging from 4 inches to 16 inches) and two big leaf maples. All trees are listed in Appendix C.

#### **4.4. Root Impacts to Large Redwoods**

This work will involve the structural root zones of approximately 25 large redwood trees ranging in diameter from 3 feet to 15 feet DBH as listed below.

- 1 - 15 feet DBH
- 1 - 13 feet DBH
- 1 - 12 feet DBH
- 1 - 10 feet DBH
- 1 - 9.6 feet DBH
- 2 - 9 feet DBH
- 1 - 8 feet DBH
- 1 - 7.8 feet DBH
- 2 - 7.5 feet DBH
- 1 - 7.2 feet DBH
- 4 - 7 feet DBH
- 2 - 6.5 feet DBH
- 2 - 5 feet DBH
- 2 - 4 feet DBH
- 1 - 3.6 feet DBH
- 1 - 3.5 feet DBH
- 1 - 3 feet DBH

Trees are considered large if their DBH is 36 inches or greater (California Department of Parks and Recreation 2005). The Structural Root Zone of a tree is the circular area with the tree trunk at the center and a radius equal to 3 times the diameter of the tree trunk measured at breast height (California Department of Parks and Recreation 2005). Additional paving and the placement of shoulder backing could cause soil compaction and disturbance within the structural root zones of large redwoods. Studies have shown that compaction of the soils within the root zone can have an adverse effect on these trees (Arnold 1975). Adverse effects to large trees may be a significant impact to this unique natural community.

#### **4.5. Culvert Work**

The improvement of five culverts (PM 1.18, 1.28, 1.34, 1.35, and 2.10) will involve placement of plastic liners, new inlets, extending or replacing the crossdrains, and/or installing new outlets. This will entail temporary soil and vegetation disturbance in a 20 ft X 20 ft (400 square feet) area at both the inlet and outlet at each culvert. Additional fill will be added to the uplands adjacent to the roadway shoulders perpendicular to the culverts.

#### **4.6. Cumulative Impacts**

Cumulative impacts are those that result from past, present, and reasonably foreseeable future actions, combined with the potential impacts of this project. An assessment of cumulative effect examines the collective impacts posed by individual projects. Cumulative impacts can result from individually minor, but collectively substantial impacts that take place over time.

Cumulative impacts to natural resources in the general project vicinity may result from projects that degrade habitat and species diversity through displacement, habitat fragmentation disruption of migration corridors, changes habitat quality, and introduction or promotion of predators. CEQA Guidelines, Section 15130, describes when a cumulative impact analysis is warranted and what elements are necessary for an adequate discussion of cumulative impacts. The definition of cumulative impacts, under CEQA, can be found in Section 15355 of the CEQA Guidelines. A definition of cumulative impacts, under NEPA, can be found in 40 CFR, Section 1508.7 of the CEQ Regulations.

### **Environmental Consequences**

Impacts to mature redwood forest and impacts to listed species are the principal environmental effects that require a cumulative impact analysis. In the proximity of the proposed project, the majority of mature redwood forest areas are protected and managed by the State Park.

Immediately north and south of the proposed project, there is some privately owned mature

redwood forest, but the area has low potential for development due to the steep terrain. There are no known large developments being proposed for the area.

Listed below are some Caltrans projects that have recently been completed, or are planned in the area included in the cumulative analysis for this action (a five mile radius north and south of the proposed project).

County/Rte	PM	EA/Project Name	Date
HUM 101	5.63	406304/Replace Seal Joints on Bridge	2008
HUM 101	0.5/13.5	451704/Culvert Replacement	2007
HUM 101	0.0/17.9	473104/Maintenance Cold Planing	2006
HUM 101	8.4/137.0	440404/Install Exit Signs	2006
HUM 101	2.4/65.3	404804/Culvert Rehabilitation	2003
HUM 101	0.35/73.9	433804/Install Culvert Markers	2003
MEN 101	1.54/106	included in job above	
HUM 101	7.48/107.2	443704/Sign Modifications	2006
MEN 101	31.7/105.1	included in job above	
HUM 101	0.18/28.5	439504/Install Reflective Pavement Markers	2003
MEN 101	92.45/100.0	included in job above	
MEN 101	19.5/103.9	440305/Install Exit Signs	2003
MEN 101	99.5/100.5	444004/Slide Removal & Crib Wall Repair	2003
MEN 101	99.5/100.5	446604/Slide Removal & Construct Rock Fence	2003
MEN 101	35.5/105	435004/Metal Beam Guardrail Repair/Replace	2004
MEN 101	85.4/106.8	473004/Maintenance Cold Planing & Surfacing	2006
MEN 101	99.5/100.5	470104/Slide Removal & Retaining Wall Repair	2007
MEN 101	98.5/100.9	39751/Realign Hwy & Construct New Bridges at Confusion Hill	2006

### **Confusion Hill**

With the exception of the Confusion Hill Realignment project, the projects listed above were improvements to the existing roadway and did not result in redwood tree removal or other substantial adverse impacts to redwoods or listed species. The Confusion Hill project did

remove redwood trees. The four largest redwoods removed ranged from 35 inches to 39 inches in diameter. The Confusion Hill project was not within designated marbled murrelet critical habitat. Surveys conducted in 2004 and 2005 did not detect the presence of any marbled murrelet within or immediately adjacent to the project limits. While there were northern spotted owls detected in the survey conducted in 2004 and 2005, the nearest nest was ¼ mile from the project limits. The Confusion Hill project was the only project from the list above that required any mitigation.

The proposed project at Richardson Grove will not result in any removal of large redwood trees. Seven redwood trees are proposed for removal ranging in size from four to sixteen inches. It is expected that the project would result in some impacts to the roots of larger redwood trees in Richardson Grove State Park, but these impacts are not anticipated to be substantial adverse impacts with the proposed minimization measures in place.

## Chapter 5. **Mitigation and Minimization Measures**

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Equipment staging/storage areas will be on the paved roadway or on existing unvegetated gravel/paved pullouts. There will be no staging in sensitive natural communities. No heavy equipment will be staged or parked within the dripline of mature trees in unpaved areas. Near drainages, measures will be taken to assure that no construction-related material can enter watercourses. Construction techniques will be employed that minimize disturbance to the natural environment. Avoidance and minimization measures will be taken to assure there is no additional direct and indirect impact to the natural environment. During and after construction sediment control measures will be employed to assure that no turbid water is discharged into receiving waters.

### **5.1. Tree and Shrub Removal**

To avoid impacts to nesting migratory birds, tree and shrub removal will take place between September 30 and March 1 before construction begins. If this is not feasible, a preconstruction bird survey will be conducted to assure that birds are not nesting in any of the vegetation to be cleared. This survey will be conducted by a qualified biologist not more than 7 days prior to the vegetation removal. If birds are nesting, the nest site and all vegetation within a 2-foot radius of the nest will be designated an Environmentally Sensitive Area and the vegetation cannot be removed until nesting is complete. All work in drainages will take place between June 1 and October 15 to avoid sediment discharge and to control erosion.

### **5.2. Revegetation**

After construction, the 2:1 cut-slope area between PM 1.35 and PM 1.37 will be replanted with the same species of trees, shrubs and ferns that were present in the disturbed area prior to construction. After tree removal, but prior to excavation of the slope-cut areas, the upper 6 to 12 inches of native soil (topsoil) will be set aside and then replaced to provide nutrients and a seed bank for regrowth. All trees and shrubs removed will be put into a chipper and distributed onto the finished cut-slope as mulch. All areas of disturbed soil will be further stabilized with redwood duff mulch after planting if needed. California State Parks and Recreation Commission Statement of Policy (Policy 11.4), Preservation of Vegetative Entities, (Neef 2003) states: "In order to maintain the genetic integrity and diversity of native California plants, all transplant and propagation in the North Coast Redwoods District will be from local populations (preferably from within the same stand). For the purpose of this policy, local is defined as being from the

immediate project area (as close as possible, but generally less than one mile).” On the slope cut areas Caltrans will plant the salvaged trees, shrubs, and ferns in a random arrangement on approximately 3 to 10-foot centers. Additional plantings of local native species will be implemented as needed to revegetate all disturbed areas. The planting will take place after November 15 (after the onset of the rainy season) to improve plant survival. After tree removal, but prior to excavation of the slope-cut areas, the upper 6 to 12 inches of native soil (topsoil) will be set aside and then replaced to provide nutrients and a seed bank for regrowth. All larger trees and shrubs removed will be put into a chipper and distributed onto the finished cut-slope as mulch. All areas of disturbed soil will be further stabilized with redwood duff mulch after planting if needed. The plant establishment period will be three years with a 75% survival rate.

A 0.57 acre area of an abandoned segment of Route 101 within the park boundaries is still designated as a Caltrans transportation easement. This designation will be relinquished and the area will be turned over to the management of California Department of Parks and Recreation. This area has experienced some recolonization of surrounding vegetation. However, the compacted soil has impeded plant establishment. To offset the loss of vegetated area due to the project’s roadway widening, an unvegetated portion of this 0.57 acre area will be de-compacted to prepare the soil for planting. The area will then be planted with locally appropriate native trees and shrubs.

### **5.3. Rare Plants**

Botanical surveys were conducted during different times of year to capture the appropriate season for detecting any rare plants in this area. A preliminary floristic survey was conducted by the Caltrans biologist, Gail Popham, on October 22, 2007. On July 26, 2007 the Caltrans biologist accompanied by a Caltrans botanist, Kim Hayler, conducted a summer floristic survey. At that time, the Caltrans botanist found only one rare plant population in the project limits. This population of sticky pea (*Lathyrus glandulosus*) is CNPS List Ranked 4.3 (Limited distribution in CA, watch list; not very endangered in CA); State Rank S3.3 (21-80 occurrences or 3,000-10,000 individuals, or 10,000-50,000 acres); Global Rank G3 (same definition as for State Rank). It is only known to occur in Humboldt & Mendocino Counties and is endemic to California (not found anywhere else in the world). This occurrence is in the middle of the species' range. These plants will be protected by temporary fencing and will not be impacted by project work (Appendix G). A late-season botanical survey conducted on February 15, 2008 found no additional rare or listed plant species in the project limits.

#### **5.4. Sediment and Erosion Control**

To maintain water quality and to minimize the movement of soils and sediment both into and within the project watercourses, effective erosion and pollution control measures will be developed and implemented. It is expected that minor amounts of sediment discharge due to this project are unavoidable. However, Caltrans will ensure that applicable Best Management Practices (BMPs) are used to stabilize all bare soil areas over both the short-term and long-terms and to minimize adverse effects to water quality, aquatic habitat and listed fishes. BMPs include treatment controls, soil stabilization practices, mitigation measures, scheduling, and contract Standard Special Provisions (SSP). Any debris and sediment will be contained within the work site, or diverted into a sedimentation basin before being returned to any receiving waters. When construction is complete, watercourse banks will be returned to natural contours. The upper six inches of duff and excavated material will be side cast and then replaced, and, if necessary, seeded and planted with local native plant species. For all areas disturbed by construction, Caltrans will monitor all revegetation efforts up to four years or until 80% success rate is achieved. All other cut-and-fill areas will be replanted in kind. Excess material excavated from the work site will be disposed of off-site at an approved disposal site away from any stream course or reused as fill on-site. Additional BMPs will include:

- Silt fences and fiber rolls will be placed to control sediment discharge; and minimal sediment will be released into receiving waters.
- Measures will be taken to prevent construction equipment effluents from contaminating soil or waters in the construction site;
- Excavated spoils will be controlled to prevent sedimentation to the stream;
- Redwood duff mulch, silt fences, and fiber rolls will be applied to exposed soil areas for over-wintering protection from erosion.
- The contractor will be require to develop and implement site-specific best management practices, a Water Pollution Control Plan, and emergency spill controls.
- No concrete washings or water from concrete will be allowed to flow into waterways. No concrete will be poured within flowing water in the waterways.
- Water that has come into contact with setting concrete will be pumped into a tank and disposed of at an approved disposal site.

## 5.5. Staging Areas

The primary staging areas will be in pull-outs to the immediate north and south of the Project Area along the Route 101 roadway. The contractor may arrange additional staging areas on private property nearby. At the end of each work shift, any vehicles stored within 150 feet of the Ordinary High Water (OHW) level of drainage facilities and watercourses will have containment placed beneath the drip zone when left overnight. Leaks will be immediately controlled with absorbent mats and repaired before the equipment operates again. Clean up of petro-chemical drips will occur as soon as they are observed. All equipment shall be monitored daily for chemical leakage. To offer protection from storm events Caltrans shall require monitoring for storm events and moving equipment accordingly.

## 5.6. Additional Measures

Due to the uniqueness of this natural community, measures will be taken to avoid and minimize impacts. Daily work windows will be observed. Disturbed areas will be replanted. To mitigate for potential structural root zone impacts to large redwoods and potential impacts to elements of marbled murrelet Critical Habitat Caltrans will implement out-of-kind mitigation. In coordination with California Department of Parks and Recreation, Caltrans will replace the 13 existing trash containers near parking, picnic and camping areas in Richardson Grove State Park with corvid proof waste receptacles to enhance habitat for nesting migratory birds in Richardson Grove.

Nest predation by corvids is the primary cause of marbled murrelet nest failure. Common ravens (*Corvus corax*), American crows (*Corvus brachyrhynchos*), and Steller's jays (*Cyanocitta stelleri*) are known to take both eggs and chicks at the nest. Studies have suggested that corvid density is especially elevated in campgrounds. These species often scavenge human garbage, discarded food, and spilled food around picnic tables and other outdoor locations (Liebezeit and George 2002). Liebezeit and George (2002) found that reduction of food sources adjacent to areas of listed species activity by using corvid proof garbage cans, can be effective discouraging corvids (examples: <http://www.bearsaver.com/CustomPanelDesigns.htm>).

Before activities associated with vegetation removal and road construction (including culvert installation and wall construction) begin, a qualified biologist approved by USFWS will conduct a training session for all personnel. At a minimum, the training will include a description of the marbled murrelet and northern spotted owl and their habitats, a description of the format of the USFWS Biological Opinion, the general measures that are being implemented to conserve the marbled murrelet and northern spotted owl as they relate to the project, and the boundaries

within which the project may be accomplished. Brochures, books and briefings may be used in the training session, provided that a qualified person is on hand to answer any questions.

Caltrans will designate a person(s) to monitor on-site compliance with all minimization measures, and who will have the authority to halt any action that might result in impacts that exceed the levels anticipated by the Caltrans and the USFWS during review of the proposed action. If work is stopped, the USFWS will be notified immediately by the Caltrans project biologist or on-site monitor. A person designated to monitor on-site compliance with all minimization measures will be present on-site during all project activities.

During project activities, all trash that may attract predators will be properly contained, removed from the work site, and disposed of daily. Following construction, all trash and construction debris will be removed from work areas.

Surveying potential breeding habitat to identify potential nesting areas is identified as a recovery action in the marbled murrelet recovery plan (U.S. Fish and Wildlife Service 1997). Therefore, as a marbled murrelet recovery measure, a qualified biologist will conduct protocol surveys for marbled murrelets in areas that contain potential marbled murrelet nesting habitat within Richardson Grove. After the surveys are completed, the results will be reported to the USFWS. Caltrans will follow the Pacific Seabird Group's Methods for Surveying Marbled Murrelets in Forests: A Revised Protocol for Land Management and Research (Evans Mack et al. 2003).

## Chapter 6. References

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## Appendices

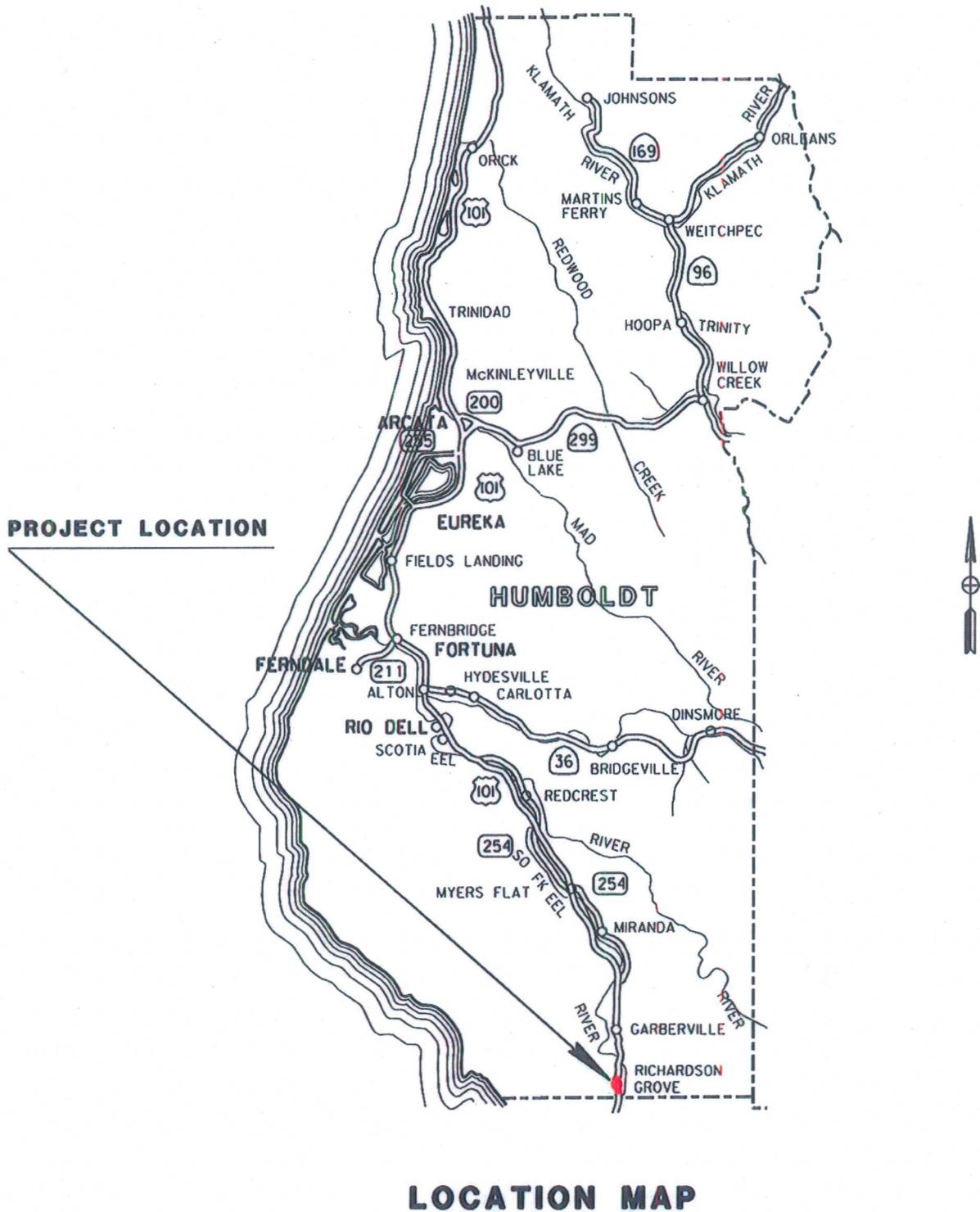
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# APPENDIX A

01-HUM-101-PM 1.1/2.2

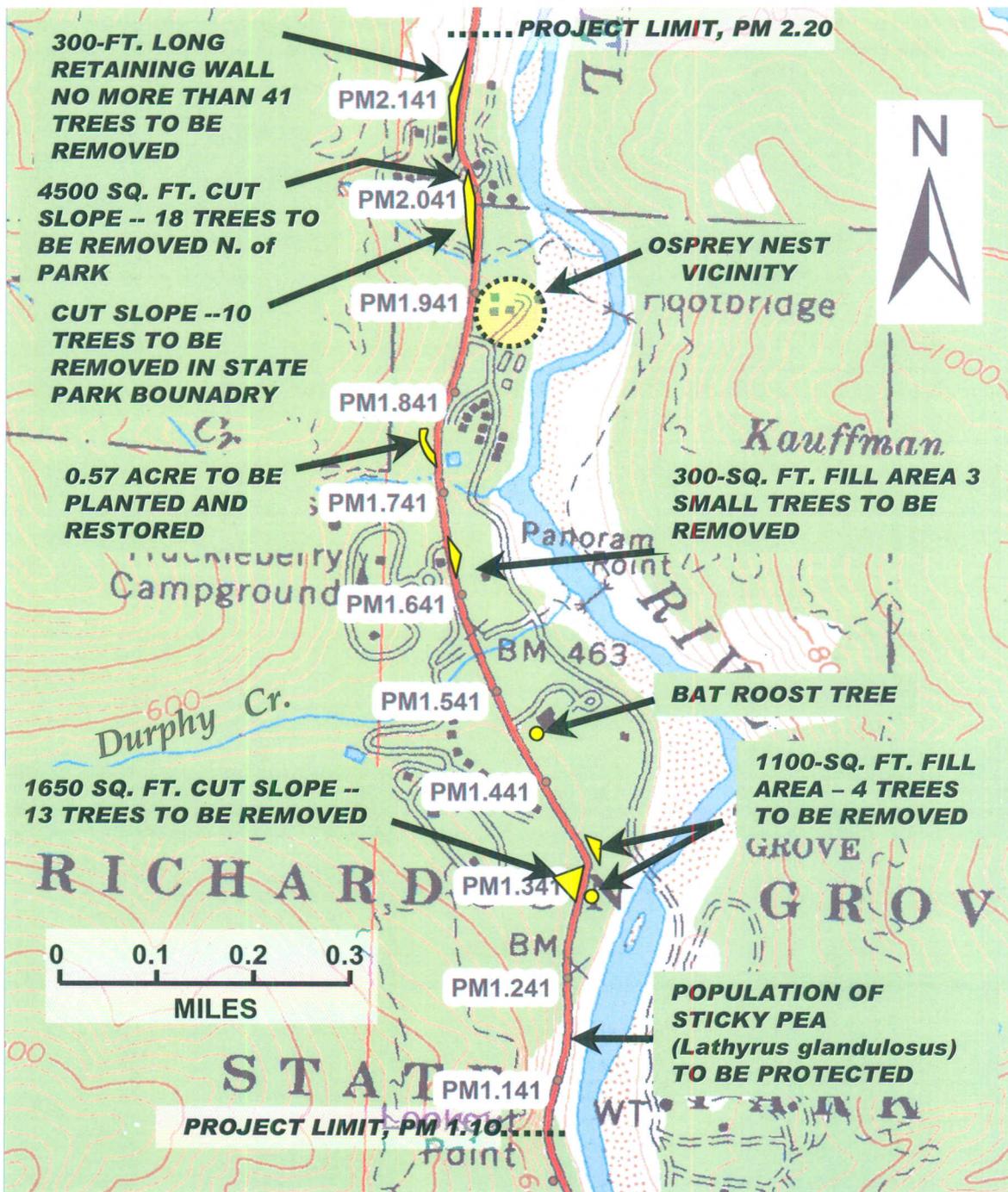
EA 01-46480

## Richardson Grove Operational Improvements



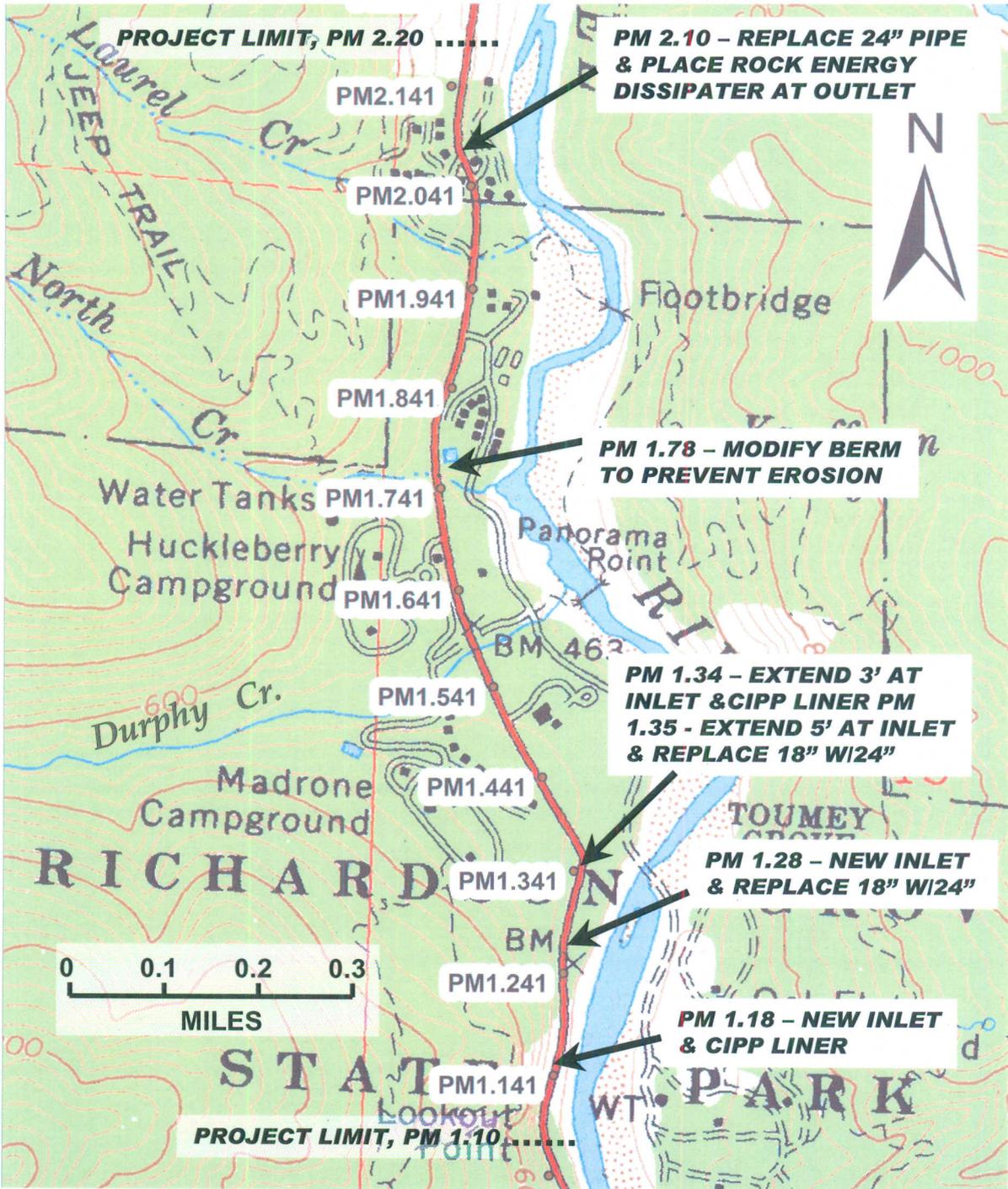
## APPENDIX B. Area map with project resources.

Garberville USGS 7.5 Minute Quadrangle  
T5S, R3E, S 11 & 12



# APPENDIX B (cont.) Culvert locations

Garberville USGS 7.5 Minute Quadrangle  
T5S, R3E, S 11 & 12



## Appendix C. Trees to be Removed

Running TOTAL	PM	L/R	Species	DBH-IN.	No. of Trees
<b>Slope Cut West of Road in Park Boundary</b>					
1	1.35	L	alder	18	1
2	1.36	L	tanoak	6	2
3	1.36	L	Douglas-fir	12	3
4	1.36	L	tanoak	6	4
5	1.36	L	tanoak	6	5
6	1.36	L	Douglas-fir	14	6
7	1.36	L	big leaf maple	17	7
8	1.36	L	Douglas-fir	22	8
9	1.36	L	big leaf maple	22	9
10	1.36	L	redwood	6	10
11	1.36	L	Douglas-fir	11	11
12	1.36	L	tanoak	4	12
13	1.37	L	Douglas-fir	15	13
<b>Fill Areas in within Park Boundary</b>					
14	1.31	R	Douglas-fir	12	1
15	1.39	R	Douglas-fir	14	2
16	1.40	R	redwood	7	3
17	1.40	R	oak	6	4
18	1.66	R	tanoak	16	5
19	1.66	R	tanoak	10	6
20	1.66	R	tanoak	10	7
<b>Slope Cut West of Road, Within Park Boundary</b>					
21	2.04	L	tanoak	10	1
22	2.04	L	tanoak	7	2
23	2.04	L	Douglas-fir	12	3
24	2.04	L	tanoak	12	4
25	2.04	L	tanoak	5	5
26	2.04	L	Douglas-fir	12	6
27	2.04	L	tanoak	24	7
27	2.04	L	Douglas-fir	18	8
29	2.04	L	tanoak	7	9
30	2.04	L	tanoak	10	10

Slope Cut West of Road, North of Park					
31	2.06	L	tanoak	12	1
32	2.06	L	tanoak	8	2
33	2.06	L	tanoak	4	3
34	2.06	L	tanoak	10	4
35	2.06	L	tanoak	10	5
36	2.06	L	tanoak	8	6
37	2.06	L	Douglas-fir	14	7
38	2.06	L	Douglas-fir	4	8
39	2.06	L	Douglas-fir	8	9
40	2.06	L	tanoak	10	10
41	2.08	L	redwood	16	11
42	2.08	L	Douglas-fir	16	12
43	2.08	L	redwood	6	13
44	2.08	L	redwood	4	14
45	2.08	L	Douglas-fir	18	15
46	2.08	L	Douglas-fir	12	16
47	2.08	L	Douglas-fir	18	17
48	2.08	L	Douglas-fir	23	18
Slope Cut at 300-ft long Retaining Wall West of Road, North of Park*					
49	2.12	L	Douglas-fir	3	1
50	2.12	L	Douglas-fir	9	2
51	2.12	L	tanoak	6	3
52	2.12	L	tanoak	18	4
53	2.12	L	redwood	8	5
54	2.12	L	redwood	10	6
55	2.12	L	tanoak	24	7
56	2.14	L	tanoak	12	8
57	2.14	L	tanoak	12	9
58	2.13	L	Douglas-fir	5	10
59	2.13	L	tanoak	12	11
60	2.14	L	tanoak	8	12
61	2.14	L	tanoak	20	13
62	2.13	L	Douglas-fir	18	14
63	2.14	L	tanoak	12	15

Slope Cut at 300-ft long Retaining Wall West of Road, North of Park (cont.)\*

64	2.14	L	tanoak	8	16
65	2.14	L	tanoak	12	17
66	2.14	L	tanoak	12	18
67	2.14	L	tanoak	12	19
68	2.14	L	Douglas-fir	18	20
69	2.15	L	tanoak	7	21
70	2.15	L	Douglas-fir	12	22
71	2.15	L	tanoak	10	23
72	2.15	L	tanoak	10	24
73	2.15	L	tanoak	10	25
74	2.15	L	tanoak	10	26
75	2.15	L	tanoak	7	27
76	2.16	L	tanoak	7	28
77	2.16	L	tanoak	6	29
78	2.16	L	tanoak	7	30
79	2.16	L	Douglas-fir	10	31
80	2.16	L	Douglas-fir	6	32
81	2.16	L	Douglas-fir	6	33
82	2.16	L	tanoak	12	34
83	2.16	L	Douglas-fir	8	35
84	2.16	L	tanoak	8	36
85	2.16	L	tanoak	8	37
86	2.16	L	tanoak	8	38
87	2.16	L	tanoak	14	39
88	2.16	L	tanoak	8	40
89	2.16	L	Douglas-fir	24	41

\* The tree estimate at the retaining wall location represents the maximum potential tree removal. Actual number of trees removed is expected to be considerably less.

## Appendix D. Potential Tree Root Impacts

	PM	R/L	species	DBH-IN.		PM	R/L	species	DBH -IN.
1	1.18	L	big leaf maple	17	21	1.37	R	redwood	18
2	1.18	L	other	12	22	1.44	R	redwood	94
3	1.26	L	redwood	18	23	1.44	R	redwood	43
4	1.26	L	redwood	48	24	1.44	L	redwood	84
5	1.29	L	redwood	84	25	1.47	L	redwood	84
6	1.29	R	redwood	48	26	1.47	L	redwood	78
7	1.30	R	Douglas-fir	12	27	1.47	R	redwood	156
8	1.31	R	Douglas-fir	16	28	1.48	L	redwood	82
9	1.32	R	Douglas-fir	24	29	1.48	L	redwood	144
10	1.32	R	oak	6	30	1.49	L	redwood	84
11	1.32	L	redwood	78	31	1.50	R	redwood	96
12	1.34	R	Douglas-fir	24	32	1.53	L	redwood	60
13	1.34	R	Douglas-fir	16	33	1.56	L	redwood	36
14	1.34	R	redwood	115	34	1.57	L	redwood	60
15	1.34	L	alder	13	35	1.61	R	redwood	182
16	1.36	R	redwood	86	36	1.67	L	redwood	120
17	1.36	R	redwood	90	37	1.67	L	redwood	108
18	1.37	R	alder	19	38	1.67	R	redwood	30
19	1.37	L	redwood	42	39	2.04	R	redwood	34
20	1.37	R	redwood	19	40	2.04	R	redwood	46

## Appendix E. Project Noise Levels

### Traffic Noise Levels

Vehicle	$L_{\max}$ @ 50 feet (dBA) (40-50 mph)
Heavy Truck	81-84
Motorcycle	81-84
Medium Truck	76-79
Auto	67-71

Source: Caltrans 1995

### Construction Noise Levels

Equipment	$L_{\max}$ @ 50 feet (dBA, slow, avg)	Equipment	$L_{\max}$ @ 50 feet (dBA, slow, avg)
All Other Equipment > 5 HP	85	Dump Truck	76
Auger Drill Rig	84	Excavator	81
Backhoe	78	Flat Bed Truck	74
Chain Saw	84	Front End Loader	79
Compactor (ground)	83	Generator	81
Compressor (air)	78	Grade-all	83
Concrete Mixer Truck	79	Jackhammer	89
Concrete Pump Truck	81	Pneumatic Tools	85
Concrete Saw	90	Pumps	73
Crane	81	Roller	80
Dozer	82	Warning Horn	83

Source: FHWA Highway Construction Noise Handbook 2006

## Appendix F. Results of Floristic Survey (7/26/07)

<i>Scientific name</i>	Common name
<b>TREES</b>	
<i>Acer macrophyllum</i>	big leaf maple
<i>Alnus rubra</i>	red alder
<i>Arbutus menziesii</i>	Pacific madrone
<i>Lithocarpus densiflorus</i>	tanoak
<i>Pseudotsuga menziesii</i> var. <i>menziesii</i>	Douglas-fir
<i>Quercus chrysolepis</i>	coast live oak
<i>Quercus garryana</i>	Oregon white oak
<i>Quercus kelloggii</i>	black oak
<i>Rhamnus purshiana</i>	cascara
<i>Sequoia sempervirens</i>	redwood
<i>Umbellularia californica</i>	California bay
<b>SHRUBS</b>	
<i>Aralia californica</i>	elkclover
<i>Baccharis pilularis</i>	coyote brush
<i>Brickellia californica</i>	California brickell bush
<i>Corylus cornuta</i>	hazelnut
<i>Euonymus occidentalis</i>	western burning bush
<i>Fraxinus latifolia</i>	Oregon ash
<i>Fraxinus</i> sp.	ash
<i>Genista monspessulana</i>	French broom
<i>Heteromeles arbutifolia</i>	toyon
<i>Mimulus aurantiacus</i>	bush monkeyflower
<i>Quercus berberidifolia</i>	scrub oak
<i>Rhamnus californica</i>	California coffee berry
<i>Ribes menziesii</i>	gooseberry
<i>Rosa gymnocarpa</i>	wild rose

<i>Rubus discolor</i>	Himalayan blackberry
<i>Rubus leucodermis</i>	wild raspberry
<i>Rubus ursinus</i>	California blackberry
<i>Sambucus racemosa</i>	red elderberry
<i>Toxicodendron diversilobum</i>	poison oak
<i>Vaccinium ovatum</i>	evergreen huckleberry
<b>FERNS &amp; RELATIVES</b>	
<i>Athyrium felix-femina</i>	maidenhair fern
<i>Equisetum hyemale</i>	giant scouring rush
<i>Equisetum telemetia</i>	common horsetail
<i>Pentagramma triangularis</i>	goldback fern
<i>Polypodium sp.</i>	polypody fern
<i>Polystichum munitum</i>	sword fern
<i>Pteridium aquilinum</i>	bracken fern
<i>Woodwardia fimbriata</i>	giant chain fern
<b>GRASSES &amp; RELATIVES</b>	
<i>Agrostis sp.</i>	bentgrass
<i>Anthoxanthum odoratum</i>	sweet vernal grass
<i>Avena sp.</i>	wild oat
<i>Briza maxima</i>	rattlesnake grass
<i>Bromus vulgaris</i>	common brome
<i>Bromus sp.</i>	brome
<i>Carex deweyana</i>	Dewey's sedge
<i>Carex globosa</i>	round fruit sedge
<i>Carex harfordii</i>	sedge
<i>Carex obnupta</i>	slough sedge
<i>Cyperus eragrostis</i>	tall flatsedge
<i>Dactylis glomertata</i>	orchard grass
<i>Elymus sp.</i>	wildrye
<i>Festuca arundinacea</i>	tall fescue
<i>Hierchloe occidentalis</i>	California vanillagrass

<i>Holcus lanatus</i>	velvetgrass
<i>Juncus balticus</i>	Baltic rush
<i>Juncus patens</i>	common rush
<i>Phalaris sp.</i>	canarycrass
<b>HERBS</b>	
<i>Adenocaulon bicolor</i>	trail plant
<i>Anaphalis margaritacea</i>	pearly everlasting
<i>Brassica sp.</i>	wild mustard
<i>Calochortus sp. (vegetative)</i>	pussy ears
<i>Campanula prenanthoides</i>	California harebell
<i>Carduus pycnocephalia</i>	Italian thistle
<i>Centaurea solstitialis</i>	yellow star thistle
<i>Centuarium muehlenbergii</i>	centaury
<i>Cerastium sp.</i>	chickweed
<i>Chlorogalum pomeridianum</i>	soaproot
<i>Cichorium sp.</i>	chicory
<i>Cirsium vulgare</i>	bullthistle
<i>Claytonia perfoliata</i>	miner's lettuce
<i>Claytonia siberica</i>	candy flower
<i>Collomia heterophylla</i>	variable leaf collomia
<i>Conyza canadensis</i>	Canadian horseweed
<i>Cynosurus echinatus</i>	dogtail grass
<i>Daucus carota</i>	wild carrot
<i>Digitalis purpurea</i>	foxglove
<i>Disporum hookeri</i>	fairy bells
<i>Epilobium canum sp. latifolium</i>	California fushia
<i>Epilobium sp.</i>	willowherb
<i>Foeniculum vulgare</i>	wild fennel
<i>Fragaria vesca</i>	wild strawberry
<i>Galium sp.</i>	bedstraw
<i>Gnaphalium californicum</i>	everlasting

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<i>Gnaphalium luteo-album</i>	everlasting
<i>Gnaphalium sp.</i>	everlasting
<i>Helenium bigelovii</i>	sneezeweed
<i>Heuchera micrantha</i>	alumroot
<i>Hieracium albiflorum</i>	hawkweed
<i>Hypericum perforatum</i>	St. Johnswort
<i>Hypochaeris radicata</i>	catsear
<i>Keckiella corymbosa</i>	redwood keckiella
<i>Lathyrus latifolius</i>	sweet pea
<i>Lathyrus vestitus</i>	pacific pea
<b><i>Lathyrus glandulosus</i></b>	<b>sticky pea (CNPS List 4.3)</b>
<i>Lonicera hispidula</i>	hairy honeysuckle
<i>Lotus corniculatus</i>	bird's foot trefoil
<i>Lotus sp.</i>	lotus
<i>Lychnis coronaria</i>	rose campion
<i>Madia madioides</i>	tarweed
<i>Madia sativa</i>	coast tarweed
<i>Melilotus alba</i>	white sweetclover
<i>Mentha pulgium</i>	pennyroyal
<i>Mimulus sp.</i>	monkeyflower
<i>Osmorhiza chilensis</i>	sweet cecily
<i>Oxalis oregana</i>	redwood sorrel
<i>Pedicularis densiflora</i>	indian warrior
<i>Petasites frigidus var. palmatus</i>	colts foot
<i>Phacelia sp.</i>	phacelia
<i>Plantago lanceolata</i>	narrow-leaf plantain
<i>Plantago major</i>	plantain
<i>Polygala californica</i>	milkwort
<i>Prunella vulgaris</i>	self-heal
<i>Rorippa nasturtium-aquaticum</i>	nasturtium
<i>Rumex acetosella</i>	sheep sorrel

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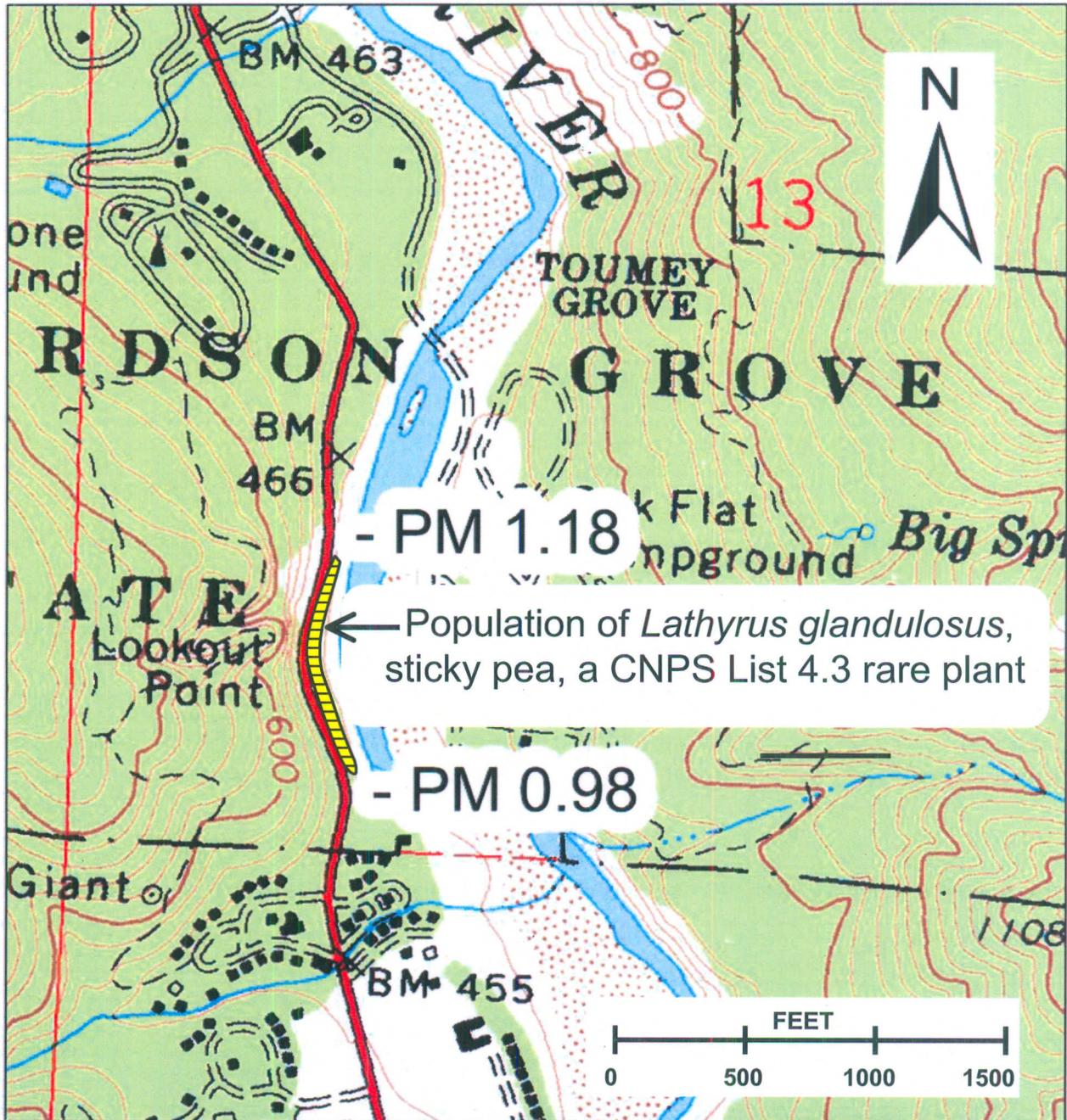
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<i>Rumex crispus</i>	curly dock
<i>Rumex salicifolius</i>	willow dock
<i>Sanicula crassicaulis</i>	sanicle
<i>Satureja douglasii</i>	yerba buena
<i>Sedum spathulifolium</i>	yellow stonecrop
<i>Smilacina racemosa</i>	western false Solomon's seal
<i>Sonchus oleraceus</i>	sow thistle
<i>Stachys sp.</i>	hedge nettle
<i>Stellaria media</i>	common chickweed
<i>Torilis arvensis</i>	bur
<i>Trientalis latifolius</i>	star-flower
<i>Trifolium repens</i>	white clover
<i>Trifolium sp.</i>	clover
<i>Trillium ovatum</i>	trillium
<i>Tritelleia laxa</i>	Ithuriel's spear
<i>Vancouveria sp.</i>	inside-out flower
<i>Vicia sp.</i>	vetch
<i>Vinca major</i>	periwinkle
<i>Viola glabella</i>	stream violet
<i>Viola sempervirens</i>	redwood violet
<i>Whipplea modesta</i>	whipplea

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## Appendix G.

Location of *Lathyrus glandulosus* (sticky pea) population.  
USGS 12.5 Minute Garberville Quad. T5S R3E S13,  
East of Rte. 101 from approx. 40.0129°N, 123.7906°W  
on the south to 40.0146°N, 123.7914°W on the north.



## Appendix H. List of Special Status Species in 9-Quad Area

Garberville, Piercy, Bear Harbor, Fort Seward, Harris, Noble Butte, Miranda, Ettersburg, and Briceland.

Scientific Name	Common Name	Status			General Habitat Description/ Flowering Period	Habitat Present/ Absent	Rationale
		Fed	St	CNPS			
<b>PLANTS</b>							
<i>Arabis macdonaldiana</i>	McDonald's rock-cross	E	E	1B.1	Rocky outcrops, slopes, and open flat benches on serpentine. Blooms May-July.	A	Survey found none
<i>Arctostaphylos canescens</i> ssp. <i>sonomensis</i>	Sonoma manzanita	None	None	1B.2	Chaparral, Lower montane coniferous forest sometimes serpentinite. Blooms Jan-Apr (Jun).	A	Survey found none
<i>Arctostaphylos stanfordiana</i> ssp. <i>raichei</i>	Raiche's manzanita	None	None	1B.1	Chaparral, Lower montane coniferous forest (openings)/rocky, often serpentinite. blooming period Feb-Apr.	A	Survey found none
<i>Astragalus agnicidus</i>	Humboldt milk-vetch	None	E	1B.1	Broadleafed upland forest, redwood forest, disturbed openings, south aspects. Blooms April - Sept.	HP	Survey found none
<i>Cardamine pachystigma</i> var. <i>dissectifolia</i>	dissected-leaved toothwort	None	None	3	Chaparral, Lower montane coniferous forest/usually serpentinite, rocky. blooming period Feb-May.	A	Survey found none
<i>Castilleja affinis</i> ssp. <i>litoralis</i>	Oregon coast Indian paintbrush	None	None	2.2	Coastal bluff scrub, Coastal dunes, Coastal scrub/sandy. Blooming period June.	A	Survey found none
<i>Castilleja mendocinensis</i>	Mendocino coast Indian paintbrush	None	None	1B.2	Coastal bluff scrub, Closed-cone , Coniferous forest, Coastal dunes, Coastal prairie, Coastal scrub, blooms Apr-Aug.	A	Survey found none
<i>Didymodon norrisii</i>	Norris' beard-moss	None	None	2.2	Cismontane woodland, lower montane coniferous forest/intermittently mesic, rock.	A	Survey found none
<i>Erigeron biolettii</i>	streamside daisy	None	None	3	Broadleafed upland forest, Cismontane woodland, North Coast coniferous forest /rocky, mesic, blooming period Jun-Oct.	A	Survey found none
<i>Eriogonum kelloggii</i>	red mountain buckwheat	C	S1.2	1B.2	Lower montane coniferous forest, chaparral, rocky serpentine sites. Blooms May - August.	A	Survey found none
<i>Erythronium revolutum</i>	coast fawn lily	None	None	2.2	Bogs and fens, Broadleafed upland forest, North Coast coniferous forest, /mesic, streambanks. Blooms Mar-Jul (Aug).	A	Survey found none

## Appendix H. List of Special Status Species in 9-Quad Area

Garberville, Piercy, Bear Harbor, Fort Seward, Harris, Noble Butte, Miranda, Ettersburg, and Briceland.

Scientific Name	Common Name	Status			General Habitat Description/ Flowering Period	Habitat Present/ Absent	Rationale
		Fed	St	CNPS			
<i>Gentiana setigera</i>	Mendocino gentian	None	None	1B.2	Lower montane coniferous forest, Meadows and seeps/mesic. Blooming period Aug-Sept.	A	Survey found none
<i>Gilia capitata</i> ssp. <i>pacifica</i>	Pacific gilia	None	None	1B.2	Coastal bluff scrub, Chaparral (openings), Coastal prairie, Valley and foothill grassland. Blooming period Apr-Aug.	A	Survey found none
<i>Lathyrus glandulosus</i>	sticky pea	None	None	4.3	<b>Cismontane woodland. Blooming period Apr-June.</b>	HP	<b>Found in Survey</b>
<i>Monardella villosa</i> ssp. <i>globosa</i>	robust monardella	None	None	1B.2	Broadleaved upland forest (openings), Chaparral (openings), Cismontane woodland, Coastal scrub, Valley and foothill grassland. Blooms Jun-Jul (Aug).	HP	Survey found none
<i>Montia howellii</i>	Howell's montia	None	None	2.2	Meadows and seeps, North Coast coniferous forest, Vernal pools /vernally mesic, sometimes roadsides. Blooming period Mar-May.	A	Survey found none
<i>Sedum eastwoodiae</i>	Red mountain stonecrop	C	S1.2	1B.2	Lower montane coniferous forest on serpentine. Blooms May- July.	A	Survey found none
<i>Tracyina rostrata</i>	beaked tracyina	None	None	1B.2	Cismontane woodland, Valley and foothill grassland. Blooming period May-June.	HP	Survey found none
<i>Viburnum ellipticum</i>	oval-leaved viburnum	None	None	2.3	Chaparral, Cismontane woodland, Lower montane coniferous forest. Blooming period May-June.	HP	Survey found none
<b>MAMMALS</b>							
<i>Androzous pallidus</i>	pallid bat	None	SC	N/A	Deserts, grasslands, shrublands, woodlands, and forests. Moat common in open, dry habitats with rocky areas for roosting. Very sensitive to disturbance of roosting sites.	HP	Potential to occur; suitable habitat
<i>Arborimus pomo</i>	Red tree vole	None	CSC	N/A	Live only in coastal coniferous. Usually found in Douglas-fir and grand fir, and western hemlock trees. Live, nest, and feed in forest canopy.	A	No habitat present
<i>Balaenoptera musculus</i>	Blue whale	E	None	N/A	Open waters, occasional inshore waters	A	No habitat present
<i>Balaenoptera physalus</i>	Fin whale	E	None	N/A	Open waters, occasional inshore waters	A	No habitat present

## Appendix H. List of Special Status Species in 9-Quad Area

Garberville, Piercy, Bear Harbor, Fort Seward, Harris, Noble Butte, Miranda, Ettersburg, and Briceland.

Scientific Name	Common Name	Status			General Habitat Description/ Flowering Period	Habitat Present/ Absent	Rationale
		Fed	St	CNPS			
<i>Balaenoptera borealis</i>	Sei whale	E	None	N/A	Temperate open seas, nearshore and offshore, from Gulf of Alaska to Baja California	A	No habitat present
<i>Martes pennanti pacifica</i>	Pacific fisher	C	CSC	N/A	Intermediate to large-tree stages of coniferous forests & deciduous-riparian areas w/ high percent canopy closure. Need large areas of mature, dense forest.	P	Potential to occur; suitable habitat present
<i>Physeter macrocephalus</i>	Sperm whale	E	None	N/A	Temperate and tropical oceans, near continental shelf, from Bering Sea to equator	A	No habitat present
<i>Megaptera novaengliae</i>	humpback whale	E	None	N/A	Open waters, occasional inshore waters	A	No habitat present
<i>Eumetopias jubatus</i>	Steller's sea-lion	T	None	N/A	Isolated shoreline and rocky islands; major rookeries are designated critical habitat. Cape Mendocino is the closest area designated as critical habitat	A	No habitat present
<b>BIRDS</b>							
<i>Accipiter cooperii</i>	Coopers hawk	None	CSC	N/A	Nests in woodland, chiefly of open, interrupted or marginal type. Nest sites mainly in riparian growths of deciduous trees, as in canyon bottoms on river flood plains; also, live oaks.	A	No habitat present
<i>Aquila chrysaetos</i>	golden eagle	None			Rolling foothills, mountain areas, sage-juniper flats and desert. Cliff walled canyons provide nesting habitat as well as large trees in open areas.	A	No habitat present
<i>Brachyrampus marmoratus</i>	marbled murrelet	T	E	N/A	Mature Douglas fir and redwood forest within 35 miles of the coast, open ocean. The project area is not within critical habitat for this species.	HP	Potential to occur; suitable habitat present
<i>Coccyzus americanus</i>	western yellow-billed cuckoo	C	None	N/A	Forest to open riparian woodlands	A	No habitat present
<i>Epidonax trailii</i>	willow flycatcher	None	E	N/A	Thickets of low, dense willows on edge of wet meadows, ponds, or backwaters	A	No habitat present

## Appendix H. List of Special Status Species in 9-Quad Area

Garberville, Piercy, Bear Harbor, Fort Seward, Harris, Noble Butte, Miranda, Ettersburg, and Briceland.

Scientific Name	Common Name	Status			General Habitat Description/ Flowering Period	Habitat Present/ Absent	Rationale
		Fed	St	CNPS			
<i>Falco peregrinus anatum</i>	American peregrine falcon	D	E	N/A	Near wetlands, lakes, rivers, or other water; on cliffs/ledges, banks, dunes, mounds; also human-made structures.	A	No habitat present
<i>Haliaeetus leucocephalus</i>	Bald eagle	D	E	N/A	Nests and roosts in large diameter trees or snags near large water bodies where prey is abundant	HP	Potential to occur; suitable habitat present
<i>Pandion haliaetus</i>	osprey	None	CSC	N/A	(Nesting) ocean shore, bays, fresh-water lakes, and larger streams. Large nests built in treetops within 15 miles of good fish-producing body of water.	HP	Active nest near PM 1.9
<i>Pelecanus occidentalis californicus</i>	California brown pelican	E	E	N/A	Nest on coastal island lacking ground predators; roost on piers, buoys, and other structures on water bodies near the coast	A	No habitat present
<i>Phoebastris albatrus</i>	Short-tailed albatross	E	None	N/A	Open ocean; nests off the coast of Japan	A	No habitat present
<i>Strix occidentalis caurina</i>	Northern spotted owl	T	None	N/A	Mature old growth forests, conifers, wooded canyons; the project area is not within critical habitat for this species.	HP	Potential to occur; suitable habitat present
<i>Synthliboramphus hypoleucus</i>	Xantus's murrelet	C	T	N/A	Pelagic waters, nest in rocky undisturbed islands, cliffs, sea caves	A	No habitat present
<b>REPTILES / AMPHIBIANS</b>							
<i>Caretta caretta</i>	Loggerhead turtle	T	None	N/A	Open ocean, seldom sighted off the northern California coast, foraging areas mostly likely exist for this species in southern California.	A	No habitat present
<i>Chelonia mydas (incl. Agassizi)</i>	Green turtle	T	None	N/A	Warm-water bays and lagoons, seldom sighted off the California coast	A	No habitat present
<i>Dermochelys coriacea</i>	Leatherback turtle	E	None	N/A	Open ocean, bays and estuaries, seldom sighted off the California coast, except in Monterey Bay	A	No habitat present
<i>Lepidochelys olivacea</i>	Olive Ridley sea turtle	T	None	N/A	Bay and lagoons, seldom sighted off the California coast.	A	No habitat present

## Appendix H. List of Special Status Species in 9-Quad Area

Garberville, Piercy, Bear Harbor, Fort Seward, Harris, Noble Butte, Miranda, Ettersburg, and Briceland.

Scientific Name	Common Name	Status			General Habitat Description/ Flowering Period	Habitat Present/ Absent	Rationale
		Fed	St	CNPS			
<i>Rana boylei</i>	foothill yellow-legged frog	None	CSC	N/A	Partly shaded, shallow streams & riffles with a rocky substrate in a variety of habitats. Need at least some cobble-sized substrate for egg laying.	HP	Potential to occur; suitable habitat present
<i>Rhyacotriton variegatus</i>	southern torrent salamander	None	CSC	N/A	Coastal redwood, Douglas-fir, mixed conifer, montane riparian, and montane hardwood-conifer habitats. Old growth forest. Cold, well-shaded, permanent streams and seepages.	HP	Potential to occur; suitable habitat present
<b>FISH</b>							
<i>Eucyclogobius newberryi</i>	tidewater goby	E	CSC	N/A	Estuaries and lagoons of coastal creeks with low salinity.	A	No habitat present
<i>Oncorhynchus kisutch</i>	central CA, So. OR/No. CA coho salmon	T	T	N/A	Pacific Ocean, nearshore marine zone and riverine and estuarine areas. Critical habitat is present in the BSA.	HP	Possible in Durphy Creek
<i>Oncorhynchus mykiss</i>	northern California steelhead	T	CSC	N/A	Pacific Ocean, spawn in coastal streams and rivers, over gravel beds	HP	Possible in Durphy Creek
<i>Oncorhynchus tshawytscha</i>	CA Coastal chinook salmon;	T	None	N/A	Pacific Ocean, spawn in large, permanent coastal streams and rivers, over gravel beds	HP	Possible in Durphy Creek

**KEY:**

(CSC) California Species of Concern  
 (E) Endangered. Listed in the Federal Register as being in danger of extinction  
 (T) Threatened. Listed as likely to become endangered within the foreseeable future  
 (C) Candidate. Candidate which may become a proposed species  
 (D) Delisted  
CNPS Listing:  
 List 1A: Plants Presumed Extinct in California  
 List 1B: Plants Rare, Threatened, or Endangered in California and Elsewhere  
 List 2: Plants Rare, Threatened, or Endangered in California, but more common elsewhere  
 List 3: Plants About Which We Need More Information - A Review List  
 List 4: Plants of Limited Distribution - A Watch List  
 Threat Ranks  
 0.1-Seriously threatened in California (high degree/immediacy of threat)  
 0.2-Fairly threatened in California (moderate degree/immediacy of threat)  
 0.3-Not very threatened in California (low degree/immediacy of threats or no current threats known)