

197/199 Safe STAA Access Project



Partial Recirculation of Draft Environmental Impact Report / Supplemental Environmental Assessment

State Clearinghouse Number: 2008082128

SR 197 and US 199 in Del Norte County
Ruby 1, 01-DN-197-PM 4.5; Ruby 2, 01-DN-197-PM 3.2-4.0;
Patrick Creek Narrows, 01-DN-199-PM 20.5-20.9, PM 23.92-24.08, & PM 25.55-25.65;
The Narrows, 01-DN-199-PM 22.7-23.0; Washington Curve, 01-DN-199-PM 26.3-26.5
EA: 01-48110, 01-45490, 01-4500U, 01-47940

**Prepared by the
State of California Department of Transportation**

The environmental review, consultation, and any other action required in accordance with applicable Federal laws for this project is being, or has been, carried out by Caltrans under its assumption of responsibility pursuant to 23 U.S.C. 327.

September 2012



General Information about This Document

What's in this document:

The California Department of Transportation (Department), as assigned by the Federal Highway Administration (FHWA) and pursuant to the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA), has prepared this Recirculated Draft Environmental Impact Report / Supplemental Environmental Assessment (RDEIR/SEA), which examines the potential environmental impacts of the alternatives being considered for the proposed project located in Del Norte County, California. The document discusses why the project is being proposed, what alternatives have been considered for the project, how the existing environment could be affected by the project, the potential impacts of each of the alternatives, and the proposed avoidance, minimization, and/or mitigation measures.

This portion of the DEIR/ED is being recirculated under CEQA Guidelines Section 15088.5 (a) and (c) to provide additional information on potential effects to trees and tree root systems, and an additional plant species. The portions of this document being recirculated are Section 2.3.1 Natural Communities and Section 2.3.3 Plant Species Biological Environment. Per CEQA Guidelines Section 15088.5 (f)(2), the Department directs reviewers to limit their comments to the revised portions of the Draft EIR/EA as set forth herein.

What you should do:

- Read this RDEIR/SEA. Additional copies of this document, as well as the supportive technical studies, and the original Draft, are available for review at:
 - Caltrans District 1 offices located at 1656 Union Street, Eureka, CA 95501.
 - Del Norte County Public Library, 190 Price Mall, Crescent City, CA
 - Humboldt County Main Library, 1313 Third Street, Eureka, CA
- We welcome your comments. If you have any comments regarding the new information on the proposed project, please send your written comments to California Department of Transportation District 1 North Region Environmental by the deadline below.
 - Submit comments via postal mail to: Jason Meyer, California Department of Transportation, North Region Environmental, Unit E1, P.O. Box 3700, Eureka, CA 95502
 - Submit comments via email to: jason_meyer@dot.ca.gov
 - Submit comments by the deadline: November 5, 2012

What happens next:

After comments are received from the public and reviewing agencies, the Department, as assigned by the Federal Highway Administration, may: (1) give environmental approval to the

proposed project, (2) do additional environmental studies, or (3) abandon the project. If the project is given environmental approval and funding is appropriated, the Department could design and construct all or part of the project.

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: Jason Meyer, California Department of Transportation, North Region Environmental, Unit E1, P.O. Box 3700, Eureka, CA 95502; (707) 445-6322 Voice, or use the California Relay 711.

197/199 Safe STAA Access Project
**Partial Recirculation of Draft Environmental Impact Report/
Supplemental Environmental Assessment**

SR 197 and US 199 in Del Norte County

Ruby 1, DN 197-PM 4.5 (EA 01-481100)

Ruby 2, DN 197-PM 3.2-4.0 (01-454900)

*Patrick Creek Narrows, DN 199-PM 20.5-20.9 (Location 1), PM 23.92-24.08
(Location 2), PM 25.55-25.65 (Location 3) (EA 01-479400)*

The Narrows, DN 199-PM 22.7-23.0 (EA 01-4500U)

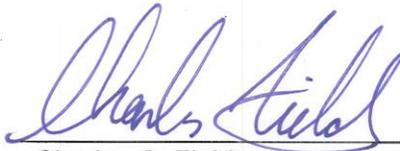
Washington Curve, DN 199-PM 26.3-26.5 (EA 01-4500U)

September 2012

Submitted Pursuant to: (State) Division 13, California Public Resources Code
(Federal) 42 USC 4332(2) C and 49 USC 303

STATE OF CALIFORNIA
Department of Transportation

Approved By:



Charles C. Fielder
District 1 Director
California Department of Transportation

Date:

Sep 12, 2012

The following person may be contacted for additional information concerning this document:

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Summary

This Recirculated Draft Environmental Impact Report / Supplemental Draft Environmental Assessment (RDEIR/SDEA) for the proposed 197/199 Safe STAA Access Project provides new information relevant to the proposed project that was not included in the Draft EIR/EA that was circulated for public review and comment in July and August 2010.

The California Department of Transportation (Department) published a Draft Environmental Impact Report/Environmental Assessment pursuant to CEQA and NEPA for the 197/199 Safe STAA Access Project in June 29, 2010 and accepted comments until August 23, 2010. Since the close of the public review period the Department has evaluated the comments received on the Draft EIR/EA and modified the document as necessary. Based in part on the strong public interest in the project's potential effects on trees and tree root systems, in particular those of large old redwood trees, and also in response to many public comments submitted in response to the DEIR/EA, the Department conducted additional analysis of the project's potential effects on trees and tree root systems, incorporated the results into the environmental document and is recirculating relevant portions pursuant to CEQA Guidelines section 15088.5(a) and CFR 1502.9(c)(1)(ii) under NEPA, contained primarily in Chapter 2.3 Biological Environment, to provide the public an opportunity to comment on the analysis and new information. As described below, the RDEIR/SDEA concludes that the Project will not result in significant impacts to trees and tree root systems, including the roots of large old redwoods.

The Department contracted with a Certified Arborist and a Registered Professional Forester to review the scientific literature, develop a methodology and use it to assess root impacts and other potential impacts to trees within and adjacent to the project footprint that would not be removed during construction. The specialists developed a methodology and assessed effects at the Ruby 1, Ruby 2 (Two-foot Widening in Spot Locations Alternative), Patrick Creek Narrows Location 2 (Downstream Bridge Replacement), and Washington Curve (Cut Slope Alternative) project locations. The specialists produced a report detailing the potential effects, analysis methods and results.

The report concluded that no large old redwoods (>36 inches diameter at breast height [dbh]) within or adjacent to the proposed project footprints at Ruby 1 and Ruby 2: Two-Foot Widening in Spot Locations Alternative would be significantly affected by the analyzed project alternatives. Some trees adjacent to Patrick Creek Location 2 and at the top of the cut at Washington Curve may have moderate effects due to the project; these effects are summarized in this document and detailed in the specialist report. None of the additional effects to trees were determined to be significant under CEQA or NEPA.

This document contains the revised Chapter 2.3.1 Biological Environment Natural Communities which contains information on large old redwood and Douglas-fir trees. This document also contains the revised Section 2.3.3 Biological Environment – Plant Species, because Siskiyou iris (*Iris brachata*) a new California Rare Plant Rank (CRPR) 3.3 was detected and analyzed. Supporting sections (References) and Appendices (E, K, N, and R) are included for reference and/or because information has changed reflecting the changes in Section 2.3.1 and 2.3.3. The Department will be responding to comments on these revised sections only, in accordance with

CEQA Guidelines 15088(f)(2), and requests that reviewers limit their comments to only subjects relevant to these revised sections.

The Department is proposing to construct improvements at spot locations on State Route 197 (SR 197) and U.S. Highway 199 (US 199) in Del Norte County to be able to reclassify the routes as part of the Federal Surface Transportation Assistance Act (STAA) truck route network and to comply with federal and state legislation and regional programs, plans, and policies to allow STAA access. The proposed project is made up of five previously identified, separately proposed projects. These five projects were referred to as Ruby 1, Ruby 2, Patrick Creek Narrows (Locations 1, 2, and 3), the Narrows, and Washington Curve and include a total of seven locations. Since circulation of the original Draft Environmental Document in 2010, the Narrows and Washington Curve have been combined into one project. The proposed project for CEQA and NEPA review in this document combines these four projects into one (due to shared purpose and need) and makes use of the names of the original five projects to identify the location of each improvement currently proposed. All seven project locations currently have roadway geometries that can result in STAA trucks and other long-wheelbase vehicles offtracking across the double yellow line and entering the oncoming traffic lane. Additionally, the limited sight distances at all seven project locations do not allow enough time for drivers to adequately react to roadway conditions ahead and make timely decisions to avoid unexpected conditions ahead.

Overview of Project Area

The proposed project is located in Del Norte County on SR 197 and US 199, east of US 101. The project vicinity and locations are shown in Figure 1-1. Within the project limits, SR 197 and US 199 are rugged, two-lane conventional highways with tight curves and steep cut-slopes providing narrow traffic lanes with narrow shoulders, if shoulders exist.

SR 197 is the designated route for the movement of extralegal¹ truck loads between US 101 and the SR 197/US 199 intersection because it avoids traversing Jedediah Smith Redwoods State Park (located along the westernmost segment of US 199 between US 101 and the SR 197/US 199 intersection) and therefore minimizes impacts on the park and associated environmental resources. SR 197, also known as North Bank Road, is a curvilinear two-lane highway built in the 1930s. It is an important link between US 199 and US 101. SR 197 primarily serves regional and interregional traffic, providing access to homes and public recreational facilities along the Smith River, including Ruby Van Deventer County Park, which provides river access.

Within the project limits, US 199 traverses the canyon of the Middle Fork Smith River. US 199 within the project limits was built in the early 1920s. Highway attributes that characterize this area include cliffs, rocky outcrops, dramatic views of the Middle Fork Smith River, and a tightly curved alignment. US 199 links US 101 north of Crescent City to Interstate 5 in Grants Pass, Oregon.

¹ An *extralegal load* is defined in CVC Section 320.5 as a single unit or an assembled item that, because of its design, cannot be reasonably reduced or dismantled in size or weight so that it can be legally transported as a load without a permit as required by CVC Section 35780. This code section does not apply to loads on passenger cars. Section 35780 requires permits for variances such as size and weight.

Purpose and Need

The purpose of the proposed project is to improve spot locations on SR 197 and US 199 in Del Norte County so that two STAA trucks passing in opposite directions can be accommodated. By making improvements to accommodate STAA trucks, the prohibition for STAA vehicles would be removed, the SR 197/US 199 route would be consistent with federal and state legislation and regional programs, plans, and policies, and the safety and operation of US 199 and SR 197 would be enhanced. This would improve goods movement, and also enhance safety on the routes for automobiles, trucks, and other large vehicles such as motor-homes, buses, and vehicles pulling trailers.

The need for the proposed project is compliance with federal and state legislation and regional programs, plans, and policies to allow STAA access. Additionally, the project is needed because spot locations on SR 197 and US 199 currently have sub-standard curves; absence of, or substandard, shoulders along the traveled way; and narrow lanes, which restrict STAA truck access in the SR 197/US 199 corridor. In 1982, the federal government passed the STAA, which indicates that states must allow STAA trucks reasonable access to terminals. Specifically, the Federal STAA requires that “States must allow commercial motor vehicles that do not exceed federal maximum width and minimum length limits applicable to the National Network to have reasonable access between the National Network and terminals and facilities for food, fuel, repairs, and rest. Terminals are defined as any location where freight originates, terminates, or is handled in the transportation process².” In summary, if there is a highway that connects two interstate routes, states must provide STAA trucks with reasonable access to terminals. US Route 101 and Interstate Route 5 are interstate routes that allow STAA trucks and that are connected by SR 197 and US 199. SR 197 and the California portion of US 199 do not allow STAA access (while the Oregon portion of US 199 does). The Federal STAA contributes to the need for the proposed project.

In support of the Federal STAA, California passed Assembly Bill (AB) 866 in 1983 to implement the STAA provisions. The 2008 Regional Transportation Improvement Program (RTIP)³ and 2007 and 2011 Regional Transportation Plans (RTPs)⁴ support and request improvement of the 197/199 corridor to allow STAA truck access. The 1999 Route Concept Reports for SR 197 and US 199 concluded that the routes should be widened and realigned to safely accommodate STAA trucks. This federal and state legislation and the regional programs, plans, and policies are discussed in further detail elsewhere in the DEIR/EA: see Section 1.2 regarding State Assembly Bill 866 (1983), see Section 2.1.1.2 for the RTIP, Section 2.1.5.1 for the RTP, and Section 1.2 for the Route Concept Reports.

US 199 serves as Del Norte County’s most direct transportation link to the interstate highway system (I-5 in Grants Pass, Oregon). The Del Norte County Local Transportation Commission considers US 199 to be the route that contributes the most to goods movement and mobility in

² U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations. 2004. Federal Size Regulations for Commercial Motor Vehicles. Access from the internet at http://ops.fhwa.dot.gov/freight/publications/size_regs_final_rpt/size_regs_final_rpt.pdf on 1/20/12.

³ 2008 RTIP accessed at http://www.dnlc.org/planningdocs/RTIP_2008.pdf on 1/26/12

⁴ 2007 RTP accessed at http://dnlc.org/planningdocs/RTP_2007.pdf on 1/26/12; 2011 RTP accessed at http://www.dnlc.org/planningdocs/RTP_2011_Final_061611.pdf accessed on 1/26/12

support of the county's economy. SR 197 is the designated route for the movement of extralegal loads⁵ between US 101 and US 199 (California Department of Transportation 1999a); therefore, it is a secondary component of this transportation link. According to the Route Concept Report for Route 197, SR 197 is the existing designated route for the movement of extralegal truck loads between US 101 and the SR 197/US 199 intersection. The SR 197–US 199 corridor is important for the goods movement because Del Norte County has neither a railway nor a deep-water shipping port. Most heavy-freight trucks leaving Del Norte County are hauling export goods bound for distribution hubs and population centers via the most expeditious route.

Alternative access to the interstate highway system is much less direct. Currently, STAA trucks that travel north on US 101 through Del Norte County to I-5 in Grants Pass must travel approximately 247 miles and more than 5 hours. Conversely, with STAA truck access on US 199, a one-way journey to I-5 in Grants Pass would be approximately 90 miles and less than 2 hours (Fehr & Peers 2010). To use US 199 to reach the interstate highway system presently, STAA truck cargo being transported from US 101 must be unloaded and transferred to shorter trucks before entering the SR 197–US 199 corridor; for trailers shorter than 48 feet, tractors can be swapped before entering the corridor.

Proposed Project

A summary of the proposed project is described below by project site. Alternatives are described where alternatives are proposed. Figures of the project sites and alternatives from the original DEIR/EA (some updated) are included in this Document for reference. More detailed descriptions can be found in the original Draft Environmental Impact Report/Environmental Assessment.

Ruby 1 (SR 197: PM 4.5)

One build alternative is being considered at this project location. To improve the roadway, the curve of the road would be lengthened and shoulders would be increased from their existing 0- to 1-foot widths. On the southbound side, the new shoulder width would vary from 0 to 4 feet. Four-foot shoulders are proposed on the northbound side. To match the new roadway width, one existing culvert would be extended, one would be replaced, and a new drainage inlet would be installed. This alignment was designed specifically to avoid removal of large old redwoods and minimize root impacts.

Ruby 2 (SR 197: PM 3.2 to 4.0)

Three build alternatives are being considered at this project location: Four-Foot Shoulders, Two-Foot Shoulders, and Two-Foot Widening in Spot Locations. Each alternative would

⁵ An *extralegal load* is defined in California Vehicle Code Section 320.5 as a single unit or an assembled item that, because of its design, cannot be reasonably reduced or dismantled in size or weight so that it can be legally transported as a load without a permit as required by California Vehicle Code Section 35780. This code section does not apply to loads on passenger cars. Section 35780 requires permits for variances such as size and weight.

improve the existing road curve, roadbed elevation, and roadway width. To match the new roadway width, four culverts would be extended or replaced. The approaches to eight private roads and one public road would be upgraded to match the modified roadway. The differences in the three alternatives are described briefly below.

Four-Foot Shoulders Alternative

This alternative would increase the shoulder widths to 4 feet on both sides of the roadway.

Two-Foot Shoulders Alternative

This alternative would increase the shoulder widths to 2 feet on both sides of the roadway.

Two-Foot Widening in Spot Locations Alternative

This alternative would increase the shoulder widths to 2 feet in spot locations. This alternative was designed specifically to avoid removal of large old redwoods and minimize root impacts. This is currently the preferred alternative for this location, because it has the least impacts to large old redwoods.

Patrick Creek Narrows Location 1 (US 199: PM 20.5 to 20.7)

One build alternative is being considered at this project location. The existing roadway curves would be improved and the roadway would be widened to accommodate two 12-foot-wide lanes and 4-foot shoulders throughout the majority of the location, transitioning to 1- to 4-foot wide shoulders at both ends of the location. To accommodate the widening and broader roadway curves, an approximately 190-foot-long, 5-foot-tall retaining wall is proposed along the river side of the road above a portion of the existing steep rock-armored riverbank. Two 18-inch culverts at PM 20.57 and 20.58 would be replaced with 24-inch culverts.

Patrick Creek Narrows Location 2 (US 199: PM 23.9 to 24.3)

Three alternatives for improvements are being considered at this project location: the Upstream Bridge Replacement, Downstream Bridge Replacement, and Bridge Preservation with Upslope Retaining Wall Alternatives. The alternatives would realign and widen the existing 11- to 12-foot lanes to 12 feet and would increase the shoulders to a width of 8 feet, transitioning to 2 to 8 foot shoulders at both ends of the project. A cut slope of 0.75:1 is anticipated. Because of the fractured nature of the bedrock, rock fall may be expected after construction. Therefore, a permanent rock-fall mitigation system may be needed. This could consist of a wire-mesh drape or incorporate a rock-fall catchment area at roadway level. One culvert within the limits within this project location would be replaced to match the new roadway width. The differences in the three alternatives are described briefly below. A sand trap would be installed along the inboard ditch. A new cross culvert will be added to carry the flow across the roadway.

Upstream Bridge Replacement Alternative

This alternative would replace the existing Middle Fork Smith River Bridge with a bridge upstream from its current location. In addition a retaining wall/rock bolting⁶ or rock net drapery would be constructed on the cut slope side of the highway. The retaining wall/rock bolting area would be approximately 400 feet long and up to 100 feet high.

Downstream Bridge Replacement Alternative

This alternative would replace the existing bridge with a bridge downstream from the current location. In addition to the retaining wall discussed above under the common features, an additional retaining wall or viaduct would be constructed downstream from the new bridge extending for approximately 240 feet and transition directly into the proposed new bridge approach. The approach structure could also be a combination of both the retaining wall and a sidehill viaduct, which would be a total length of approximately 345 feet. This is currently the preferred alternative for this location.

Bridge Preservation with Upslope Retaining Wall Alternative

This alternative would retain the existing bridge but realign the roadway on either end of the bridge to allow large trucks to cross. In addition to the retaining wall discussed above under the common features an additional retaining wall/rock bolting or rock net drapery would be constructed on the cut slope side of the highway, measuring approximately 300 feet long and up to 100 feet high.

Patrick Creek Narrows Location 3 (US 199: PM 25.55 to 25.65)

One build alternative is being considered for this project location. This alternative would increase the shoulder width to at least 8 feet on both sides of the road and eliminate the current "S" curve. To support the wider roadway, an approximately 180-foot-long wall up to an approximate height of 15 feet is proposed on the river side. Two 18" culverts within the limits of this project location at PM 25.55 and 25.69 would be replaced with 24" culverts." Drainage inlets would be installed at the inlets for the culverts at PM 25.55, 25.61, and 25.69.

The Narrows (US 199: PM 22.7 to 23.0)

One build alternative is being considered for this project location. This alternative would increase lane widths to 12 feet and provide 2-foot shoulders. Widening would be accomplished by excavating into the existing cut slope. A 1-foot-wide paved drainage ditch would be added at the shoulder of the road for a total paved width of approximately 29 feet. One new culvert and drain inlet would be constructed. Also, an existing culvert and drain inlet would be replaced to match the new edge of pavement. In addition to roadway widening, isolated outcrops of overhanging or loose rock above the excavation limits would be stabilized with rock bolting or other means.

⁶ The purpose of rock bolting is to pin two planes of rock together by bolting the slipping plane to a solid rock plane. Rock bolts secure permanent steel bars that are grouted, tensioned, and locked into place with a metal faceplate on the final cut slope.

Washington Curve (US 199: PM 26.3 to 26.5)

Two build alternatives are being considered at this project location: the Cut Slope and the Retaining Wall Alternatives. The features common to both build alternatives include the following. These alternatives would improve the compound curve at this project location and increase widths to a minimum of 12 foot lanes and 4 foot shoulders. The differences in the two alternatives are described briefly below.

Cut Slope Alternative

A new slope would be excavated on the cut slope side of the roadway. This is currently the preferred alternative for this location.

Retaining Wall Alternative

This alternative would construct a retaining wall along the cut slope of the roadway to provide additional roadway width.

CEQA/NEPA Environmental Document

The proposed project is a joint project by the Department and the Federal Highway Administration (FHWA), and is subject to state and federal environmental review requirements. Therefore, project documentation has been prepared in compliance with both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). The Department is the lead agency under CEQA. In addition, FHWA's responsibility for environmental review, consultation, and any other action required in accordance with applicable Federal laws for this project is being, or has been, carried out by the Department under its assumption of responsibility pursuant to 23 U.S. Code 327.

Some impacts determined to be significant under CEQA may not lead to a determination of significance under NEPA. Because NEPA is concerned with the significance of the project as a whole, it is quite often the case that a "lower level" document is prepared for NEPA. One of the most commonly seen joint document types is an Environmental Impact Report/Environmental Assessment (EIR/EA).

Following receipt of public comments on the Recirculated Draft EIR/ Supplemental EA and circulation of the Final EIR/EA, the Department will be required to take actions regarding the environmental document. The Department will determine whether to certify that the EIR and issue Findings and a Statement of Overriding Considerations under CEQA and to issue a Finding of No Significant Impact (FONSI) or require an Environmental Impact Statement (EIS) under NEPA.

Project Impacts

Table S-1 summarizes the potential project effects after measures to avoid and minimize environmental harm are implemented. These effects have not changed since the DEIR/EA with the new information. For every project site and alternative in the table, each potential effect is categorized as having either "no impact," if it would not affect a given environmental topic; "no

| Environmental Topic | Potential Effect | SR 197 Sites and Build Alternatives | | | | US 199 Sites and Build Alternatives | | | | | | | No Build (No Action) Alternative | |
|--|--|-------------------------------------|---------------------|--------------------|--------------------------------------|-------------------------------------|----------------------------------|-------------------------------|---|----------------------------------|--------------------|--------------------|----------------------------------|--------------------|
| | | Ruby 1 | Ruby 2 | | | Patrick Creek Narrows Location 1 | Patrick Creek Narrows Location 2 | | | Patrick Creek Narrows Location 3 | The Narrows | Washington Curve | | |
| | | | Four-Foot Shoulders | Two-Foot Shoulders | Two-Foot Shoulders in Spot Locations | | Upstream Bridge Replacement | Downstream Bridge Replacement | Bridge Preservation with Upslope Retaining Wall | | | Cut Slope | | Retaining Wall |
| Land Use Consistency | Consistency with Crescent City General Plan | Consistent | Consistent | | | Consistent | Consistent | | | Consistent | Consistent | Consistent | | Consistent |
| | Consistency with County General Plan | Consistent | Consistent | | | Consistent | Consistent | | | Consistent | Consistent | Consistent | | Consistent |
| | Consistency with Six Rivers National Forest/Smith River National Recreation Area | Consistent | Consistent | | | Consistent | Consistent | | | Consistent | Consistent | Consistent | | Consistent |
| | Consistency with Mission of Del Norte Local Transportation Commission | Consistent | Consistent | | | Consistent | Consistent | | | Consistent | Consistent | Consistent | | Consistent |
| | Consistency with Smith River Scenic Byway | Consistent | Consistent | | | Consistent | Consistent | | | Consistent | Consistent | Consistent | | Consistent |
| | Consistency with Existing Land Uses | Consistent | Consistent | | | Consistent | Consistent | | | Consistent | Consistent | Consistent | | Consistent |
| Wild and Scenic Rivers | Potential Impacts to Wild and Scenic Rivers | No impacts | No impacts | | | No impacts | No adverse impacts | | | No impacts | No impacts | No impacts | | No impacts |
| Parks and Recreation | Temporary Effects on Parks and Recreation Facilities During Construction | No adverse impacts | | | | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | No adverse impacts | | No impacts |
| Growth | Potential for Growth Impacts | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | No adverse impacts | | No impacts |
| Community Character and Cohesion | Temporary Construction-Related Access and Circulation Impacts | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | No adverse impacts | | No impacts |
| | Temporary Impacts on Parking During Construction | No adverse impacts | No impacts | No impacts | No impacts | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | No adverse impacts | | No impacts |
| Relocations and Real Property Acquisitions | Property Acquisitions for Permanent Right-of-Way | No impacts | No adverse impacts | No adverse impacts | No adverse impacts | No impacts | No adverse impacts | No impacts | No adverse impacts | No adverse impacts | No impacts | No impacts | | No impacts |
| Utilities/Emergency Services | Temporary Delays for Law Enforcement, Fire, and Emergency Service Providers | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | No adverse impacts | | No impacts |
| Traffic and Transportation/Pedestrian and Bicycle Facilities | Traffic Delays During Construction (see Chapter 1, Tables 1-2 and 1-3) | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | No adverse impacts | | No impacts |
| Visual/Aesthetics | Change the Existing Visual Character or Quality of Project Site and its Surroundings | No adverse impacts | No adverse impacts | No adverse impacts | | No adverse impacts | No adverse impacts | No adverse impacts | | No adverse impacts | No adverse impacts | No adverse impacts | No adverse impacts | No impacts |
| Cultural Resources | Potential Cultural Resource Impacts | No impacts | No impacts | | | No impacts | No impacts | | | No impacts | No impacts | No impacts | | No impacts |
| Hydrology and Floodplain | Potential Hydrology and/or Floodplain Impacts | No adverse impacts | No adverse impacts | | | No impacts | No impacts | | | No impacts | No impacts | No impacts | | No adverse impacts |
| Water Quality and Storm Water Runoff | Potential for Reduced Water Quality from Increased Storm Water Runoff | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | No adverse impacts | No adverse impacts | No impacts |
| | Potential for Reduced Water Quality from Erosion | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | No adverse impacts | | No adverse impacts |
| | Potential for Reduced Water Quality from Loss of Wetland and Other Jurisdictional Waters | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | No adverse impacts | | No impacts |

| Environmental Topic | Potential Effect | SR 197 Sites and Build Alternatives | | | | US 199 Sites and Build Alternatives | | | | | | No Build (No Action) Alternative | | |
|---|--|-------------------------------------|--|--------------------|--------------------------------------|-------------------------------------|----------------------------------|-------------------------------|---|----------------------------------|--------------------|----------------------------------|------------------|--------------------|
| | | Ruby 1 | Ruby 2 | | | Patrick Creek Narrows Location 1 | Patrick Creek Narrows Location 2 | | | Patrick Creek Narrows Location 3 | The Narrows | | Washington Curve | |
| | | | Four-Foot Shoulders | Two-Foot Shoulders | Two-Foot Shoulders in Spot Locations | | Upstream Bridge Replacement | Downstream Bridge Replacement | Bridge Preservation with Upslope Retaining Wall | | | | Cut Slope | Retaining Wall |
| Geology/Soils/Seismic/ Topography | Potential for Erosion, Landslide, and Rock Fall | No adverse impacts | No adverse impacts | No adverse impacts | | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | No adverse impacts | | No adverse impacts |
| | Potential for Construction-Related Soil Erosion and Sedimentation | No impacts | No impacts | | | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | No adverse impacts | | No impacts |
| | Potential Impacts on Worker Safety during Blasting Operations | No blasting | No blasting | | | No blasting | No adverse impacts | | | No blasting | No adverse impacts | No blasting | No blasting | No impacts |
| | Potential Impacts on Worker Safety from Rock Fall during Construction of Cut Slopes | No impacts | No impacts | | | No impacts | No adverse impacts | No adverse impacts | | No impacts | No adverse impacts | No adverse impacts | No impacts | No impacts |
| | Potential for Debris to Enter River During Bridge Demolition | No impacts | No impacts | | | No impacts | No adverse impacts | | No impacts | No impacts | No impacts | No impacts | | No impacts |
| Hazardous Waste/ Materials | Potential for Hazardous Material Spills During Construction | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | No adverse impacts | | No impacts |
| | Potential for Exposure to Aerially-Deposited Lead | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | No adverse impacts | | No impacts |
| | Potential for Release of Hazardous Waste/Materials Associated with Construction, Traffic, or Roadway Maintenance | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | No adverse impacts | | No impacts |
| | Potential for Release of Hazardous Waste/Materials Associated with the Removal or Modification of Facilities or Structures | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | No adverse impacts | | No impacts |
| | Potential Impacts Associated With Naturally-Occurring Asbestos | No impacts | No impacts | | | No adverse impacts | No impacts | | | No impacts | No impacts | No adverse impacts | | No adverse impacts |
| Air Quality | Temporary Increase in Ozone Precursor (ROG and NOx), CO, and PM10 Emissions during Grading and Construction Activities | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | No adverse impacts | | No impacts |
| | Release of Naturally-Occurring Asbestos Fibers into the Air During Grading and Construction Activities | No impacts | No impacts | | | No adverse impacts | No impacts | | | No impacts | No impacts | No adverse impacts | | No adverse impacts |
| Noise and Vibration | Potential Disturbance from Construction Noise Levels (Non-Blasting) | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | No adverse impacts | | No impacts |
| | Potential for Disturbance to Nearby Noise-Sensitive Land Uses from Controlled Blasting Activities | No blasting | No blasting | | | No blasting | No adverse impacts | | | No blasting | No adverse impacts | No blasting | | No impacts |
| Natural Communities (See Section 2.3.1 for detailed comparisons of effects by alternative) | Permanent removal of natural communities at a given project location | No adverse impacts | Adverse impact greater than Two-Foot Shoulders in Spot Locations Alternative | | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | No adverse impacts | | No impacts | |
| | Temporary disturbance and effects on natural communities. | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | No adverse impacts | | No impacts |
| | Permanent removal of redwood trees with a dbh of 36 inches or more | No impacts | Adverse impact greater than Two-Foot Shoulders in Spot Locations Alternative | | No impacts | No impacts | | | No impacts | No impacts | No impacts | | No impacts | |
| | Permanent removal of trees other than redwoods | No adverse impacts | No adverse impacts | | | No impacts | No adverse impacts | | | No impacts | No impacts | No adverse impacts | | No impacts |
| | Temporarily Restrict the Passage of Fish, including Anadromous Fish | No impacts | No impacts | | | No impacts | No adverse impacts | | No impacts | No impacts | No impacts | No impacts | | No impacts |

| Environmental Topic | Potential Effect | SR 197 Sites and Build Alternatives | | | | US 199 Sites and Build Alternatives | | | | | | No Build (No Action) Alternative | | |
|---|--|-------------------------------------|--|--------------------|--------------------------------------|-------------------------------------|----------------------------------|-------------------------------|---|----------------------------------|--------------------|----------------------------------|------------------|--------------------|
| | | Ruby 1 | Ruby 2 | | | Patrick Creek Narrows Location 1 | Patrick Creek Narrows Location 2 | | | Patrick Creek Narrows Location 3 | The Narrows | | Washington Curve | |
| | | | Four-Foot Shoulders | Two-Foot Shoulders | Two-Foot Shoulders in Spot Locations | | Upstream Bridge Replacement | Downstream Bridge Replacement | Bridge Preservation with Upslope Retaining Wall | | | | Cut Slope | Retaining Wall |
| Wetlands and Other Waters (See Section 2.3.2 for detailed comparisons of fill by alternative) | Temporary impacts to wetlands and/or other waters | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | No adverse impacts | | No impacts |
| | Permanent impacts to wetlands and/or other waters | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | No adverse impacts | | No impacts |
| Plant Species (See Section 2.3.3 for detailed comparisons of effects by alternative) | Permanent removal of native plant habitat at a given project location | No impacts | No impacts | | | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | No adverse impacts | | No impacts |
| | Permanent Effects on Specific Special-Status and CNPS List 4 Plants | No impacts | No impacts | | | No adverse impacts | No adverse impacts | No adverse impacts | No adverse impacts | No adverse impacts | No adverse impacts | No impacts | | No impacts |
| Animal Species (See Section 2.3.4 for detailed comparisons of effects by alternative) | Temporary disturbance to special-status animal species and their habitat | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | No adverse impacts | | No impacts |
| | Permanent removal of habitat for animal species | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | No adverse impacts | | No impacts |
| | Effects on Chinook salmon | No impacts | No impacts | | | No impacts | No adverse impacts | | No impacts | No impacts | No impacts | No impacts | | No impacts |
| | Effects on coastal cutthroat trout | No impacts | No impacts | | | No impacts | No adverse impacts | | No impacts | No impacts | No impacts | No impacts | | No impacts |
| Threatened and Endangered Species (See Section 2.3.5 for detailed comparisons of effects by alternative) | Temporary disturbance to threatened and endangered species and their habitat | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | No adverse impacts | | No impacts |
| | Permanent removal of habitat for threatened and endangered species | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | No adverse impacts | | No impacts |
| Invasive Species | Potential for proposed location improvements to promote spread of invasive species | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | | | No adverse impacts | No adverse impacts | No adverse impacts | | No adverse impacts |
| Potential Cumulative Impacts to Environmental Resources | Contribution to Cumulative Loss of Old-Growth Redwood Trees | No adverse impacts | Adverse impact greater than Two-Foot Shoulders in Spot Locations Alternative | | No adverse impacts | No impacts | No impacts | | | No impacts | No impacts | No impacts | | No impacts |

adverse impact,” if it would not have a significant, harmful effect on an environmental topic; or “adverse,” if it could have a significant effect on an environmental topic. Note that the term “adverse” may have a different threshold or definition, depending on whether the impact is being considered under federal or state laws. For example, a finding of May Affect, Likely to Adversely Affect for a federally listed species could be proposed for a variety of impact types, including harassment, under the federal Endangered Species Act (ESA). That finding may or may not be determined to be significant, depending on whether anticipated impacts are temporary/permanent and the kind and level of impact (e.g., harassment only, versus killing, and the anticipated number of individuals or population(s) that might be affected). Conversely, harassment is not considered under the California ESA, so harassment would not be considered adverse or significant. Details of each environmental topic, potential effect, and associated avoidance, minimization, and/or mitigation measures are discussed in Chapter 2.

Coordination with Other Public Agencies

Table S-2 describes the permits, reviews, and approvals required for project construction. This information is reiterated in Table 1-5 in Chapter 1.

Table S-2. Permits and Approvals

| Agency | Permit/Approval | Status |
|---|--|-------------------|
| U.S. Fish and Wildlife Service (USFWS) | Endangered Species Act (ESA) Section 7 consultation for threatened and endangered species | Ongoing |
| National Marine Fisheries Service (NMFS) | ESA Section 7 consultation for threatened and endangered species | Ongoing |
| U.S. Army Corps of Engineers | Clean Water Act (CWA) Section 404 authorization for fill of waters of the United States | Ongoing |
| U.S. Department of Agriculture Forest Service | Coordination based on Forest Service sensitive and Northwest Forest Plan species, tree removal permit, scenic byway and Wild and Scenic River concurrence for the Middle Fork Smith River (US 199), Section 4(f) coordination and concurrence, and coordination for conducting work within the Department’s right-of-way easement held by the Forest Service | Ongoing |
| Del Norte County Parks Department | Temporary easement in Ruby Van Deventer County Park for driveway improvements | Ongoing |
| California Department of Fish and Game | California Fish and Game Code Section 1602 streambed alteration agreement and California Wild and Scenic Rivers coordination through the Section 1602 application process (Smith River coordination via 1602 agreements for SR 197 locations, and Middle Fork Smith River coordination via 1602 agreements for US 199 locations) | Ongoing |
| National Park Service | Wild and Scenic River concurrence for the Smith River | Completed |
| North Coast Regional Water Quality Control Board | CWA Section 401 water quality certification and coverage under the Department’s National Pollutant Discharge Elimination System permit (Order 00-06-DWQ) | Ongoing |
| North Coast Unified Air Quality Management District | Formal notification submitted a minimum of 14 days before construction, permit for compliance with national emission standards for hazardous air pollutants, acceptance of dust control plan, and acceptance of lead compliance plan | Not yet initiated |

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List of Acronyms

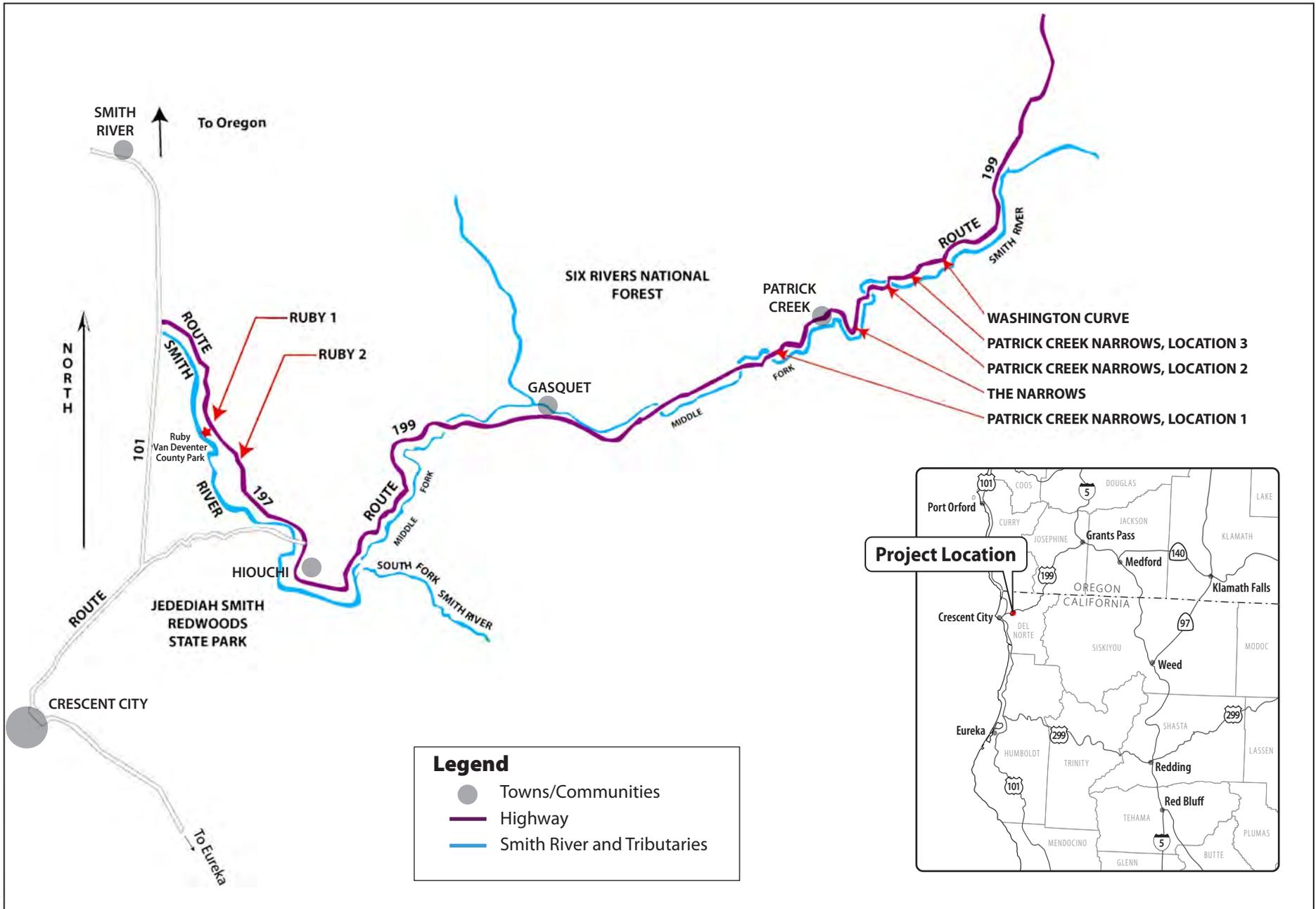
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|--------------------------|--|
| $\mu\text{g}/\text{m}^3$ | micrograms per cubic meter |
| AADT | annual average daily traffic |
| AB 1493 | Assembly Bill 1493 |
| ACMs | asbestos-containing materials |
| ADL | aerially deposited lead |
| ADT | average daily traffic |
| AMR | American Medical Response |
| APCO | Air Pollution Control Officer |
| APE | Area of Potential Effects |
| APN | Assessor's Parcel Number |
| ASR | Archaeological Survey Report |
| ATCMs | Airborne Toxic Control Measures |
| BFE | Base Flood Elevation |
| BML | Bald Mountain-Big Lagoon |
| BMPs | Best Management Practices |
| BSA | biological study area |
| CAAQS | California Ambient Air Quality Standards |
| CAFE | Corporate Average Fuel Economy |
| CAL FIRE | California Department of Forestry and Fire Protection |
| Cal/OSHA | California Division of Occupational Safety and Health |
| Cal-IPC | California Invasive Plant Council |
| Cal-IPC Inventory | California Invasive Plant Inventory |
| CARB | California Air Resources Board |
| CAT | Citizens Advisory Team |
| CCR | California Code of Regulations |
| CEDS | Comprehensive Economic Development Strategy, Del Norte County, California, 2006–2008 |
| CEQ | Council on Environmental Quality |
| CEQA | California Environmental Quality Act |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act of 1980 |
| CESA | California Endangered Species Act |
| CFR | Code of Federal Regulations |
| CH ₄ | methane |
| CHP | California Highway Patrol |
| CHRIS | California Historical Resources Information System |
| CIA | Community Impact Assessment |
| CMV | commercial motor vehicle |
| CNPS | California Native Plant Society |
| CO | carbon monoxide |
| CO ₂ | carbon dioxide |

| | |
|-----------------------------|--|
| Coastal Act | California Coastal Act of 1976 |
| Construction General Permit | General Permit for Construction Activities |
| COZEPP | Construction Zone Enhanced Enforcement Program |
| CRHR | California Register of Historical Resources |
| CSP | corrugated steel pipe |
| CTSA | Consolidated Transportation Service Agency |
| CWA | Clean Water Act |
| dba | A-weighted decibel |
| dbh | diameter at breast height |
| DEMO (HPP) | Federal Demonstration–High Priority Project |
| Department | California Department of Transportation |
| DFG | California Department of Fish and Game |
| DLCRC | District Lane Closure Review Committee |
| DNADS | Del Norte Association for Developmental Services |
| DNLTC | Del Norte Local Transportation Commission |
| DOT | Department of Transportation |
| DPS | Distinct Population Segment |
| DTSC | California Department of Toxic Substances Control |
| EA | Expense Authorization |
| EFH | Essential Fish Habitat |
| EIR/EA | Environmental Impact Report/Environmental Assessment |
| EIS | Environmental Impact Statement |
| EO | Executive Order |
| EPA | U.S. Environmental Protection Agency |
| ESA | Endangered Species Act |
| FEMA | Federal Emergency Management Agency |
| FHWA | Federal Highway Administration |
| FIRM | Flood Insurance Rate Map |
| FONSI | Finding of No Significant Impact |
| Forest Service | U.S. Department of Agriculture Forest Service |
| FR | Federal Register |
| Geocon | Geocon Consultants |
| GHG | greenhouse gas |
| HAPs | hazardous air pollutants |
| HFCs | hydrofluorocarbons |
| HPSR | Historic Property Survey Report |
| Hz | Hertz |
| I-5 | Interstate 5 |
| IGR | Intergovernmental Review |
| IPCC | Intergovernmental Panel on Climate Change |
| IRIS | Integrated Risk Information System |
| ISA | initial site assessment |
| ITS | Intelligent Transportation Systems |
| ITSP | 1998 Interregional Transportation Strategic Plan |

| | |
|------------------|---|
| KPRA | kingpin-to-rear-axle |
| LCP | lead-containing paint |
| L _{eq} | equivalent sound level |
| LID | Low Impact Development |
| LOS | level of service |
| LOTB | As-Built Log of Test Borings |
| MBTA | Migratory Bird Treaty Act of 1918 |
| MCE | Maximum Credible Earthquake |
| MEP | maximum extent practicable |
| mg/kg | milligrams per kilogram |
| MLD | Most Likely Descendent |
| mpg | miles per gallon |
| mph | miles per hour |
| MS4 | Municipal Separate Storm Sewer System |
| MSATs | mobile source air toxics |
| N ₂ O | nitrous oxide |
| NAAQS | National Ambient Air Quality Standards |
| NAC | noise abatement criteria |
| NAHC | Native American Heritage Commission |
| NATA | 1999 National Air Toxics Assessment |
| NCAB | North Coast Air Basin |
| NCIC | North Coastal Information Center |
| NCRWQCB | North Coast Regional Water Quality Control Board |
| NCUAQMD | North Coast Unified Air Quality Management District |
| NEPA | National Environmental Policy Act |
| NES | Natural Environment Study |
| NESHAPs | National Emissions Standards for Hazardous Air Pollutants |
| NHPA | National Historic Preservation Act of 1966, as amended |
| NMFS | National Marine Fisheries Service |
| NN | National Network |
| NO | nitric oxide |
| NO ₂ | nitrogen dioxide |
| NOA | naturally occurring asbestos |
| NOC | Notice of Construction |
| NOP | Notice of Preparation |
| NO _x | oxides of nitrogen |
| NPDES | National Pollutant Discharge Elimination System |
| NPS | National Park Service |
| NRA | National Recreation Area |
| NRHP | National Register of Historic Places |
| O ₃ | ozone |
| ODOT | Oregon Department of Transportation |
| OES | Del Norte County Office of Emergency Services |
| OGFC | open-graded friction course (a type of asphalt concrete) |

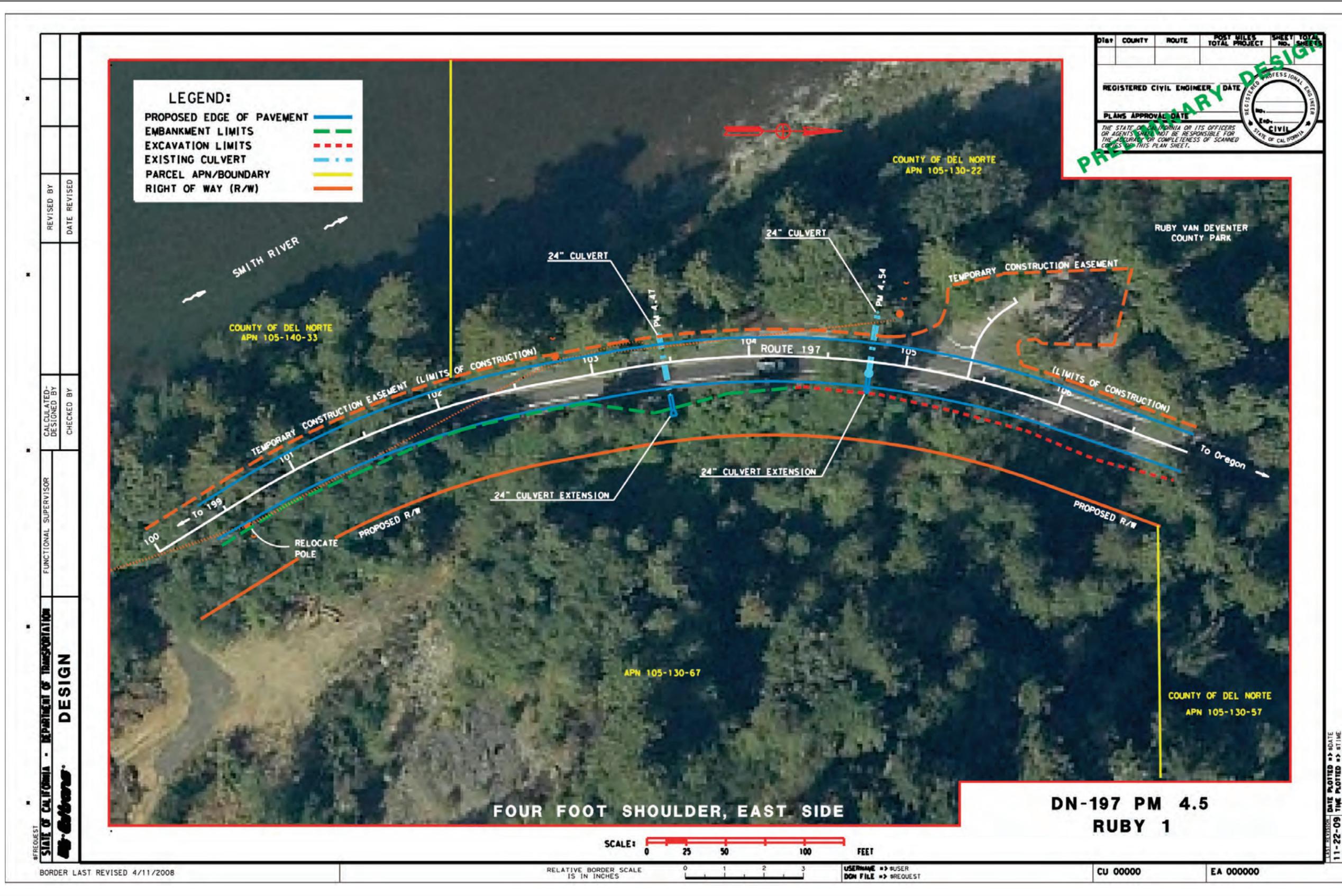
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| OHP | California Office of Historic Preservation |
| OHWM | ordinary high water mark |
| OSHA | Occupational Safety and Health Administration |
| PA | Programmatic Agreement |
| Pb | lead |
| PF | Public Facility |
| PFCs | perfluorocarbons |
| Planning Area | Crescent City Planning Area |
| PM | post mile |
| PM10 | particulate matter less than 10 micrometers in diameter |
| PM2.5 | particulate matter less than 2.5 micrometers in diameter |
| POC | Port Orford Cedar |
| POM | Polycyclic organic matter |
| PPDG | Project Planning and Design Guide |
| ppm | parts per million |
| ppv | peak particle velocity |
| PRC | Public Resources Code |
| psi | pounds per square inch |
| RAP | Relocation Assistance Program |
| RCRA | Resource Conservation and Recovery Act of 1976 |
| RCT | Redwood Coast Transit |
| ROD | Record of Decision-Standards and Guidelines |
| ROG | reactive organic compounds |
| RR-1/1 | Rural Residential—1 dwelling unit per acre |
| RSA | resource study area |
| RSP | rock slope protection |
| RTIP | Del Norte Local Transportation Commission's 2008 Regional Transportation Improvement Program for Del Norte County |
| RTP | Regional Transportation Plan |
| RWQCB | Regional Water Quality Control Board |
| S&M | Survey and Manage |
| sf | square feet |
| SF ₆ | sulfur hexafluoride |
| SHOPP | State Highway Operation and Protection Program |
| SHPO | State Historic Preservation Officer |
| Six Rivers RMP | Six Rivers National Forest Land and Resource Management Plan |
| SMAQMD | Sacramento Metropolitan Air Quality Management District's |
| SO ₂ | sulfur dioxide |
| SPGR | Structure Preliminary Geotechnical Report |
| SR | State Route |
| SRNF | Six Rivers National Forest |
| STAA | Surface Transportation Assistance Act |
| STLC | soluble threshold limit concentration |
| SWDR | Storm Water Data Report |

| | |
|-----------------|---|
| SWMP | Storm Water Management Plan |
| TACs | toxic air contaminants |
| TASAS | Traffic Accident Surveillance and Analysis System |
| TDM | Transportation Demand Management |
| THP | timber harvesting plan |
| THPO | Tribal Historic Preservation Officer |
| TMDLs | Total Maximum Daily Loads |
| TMP | Transportation Management Plan |
| TSM | Transportation System Management |
| TWW | Treated Wood Waste |
| U.S.C. | United States Code |
| UC Davis | University of California Davis |
| US | U.S. Route |
| US 101 | U.S. Highway 101 |
| USACE | U.S. Army Corps of Engineers |
| USBM | U.S. Bureau of Mines |
| USC | U.S Code |
| USFWS | U.S. Fish and Wildlife Service |
| USDOT | U.S. Department of Transportation |
| USGS | U.S. Geological Survey |
| VMT | vehicle miles traveled |
| vpd | vehicles per day |
| VQO | visual quality objectives |
| WET | Wetland Evaluation Technique |
| yd ³ | cubic yards |



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Figure 1-1
Project Vicinity and Location Map



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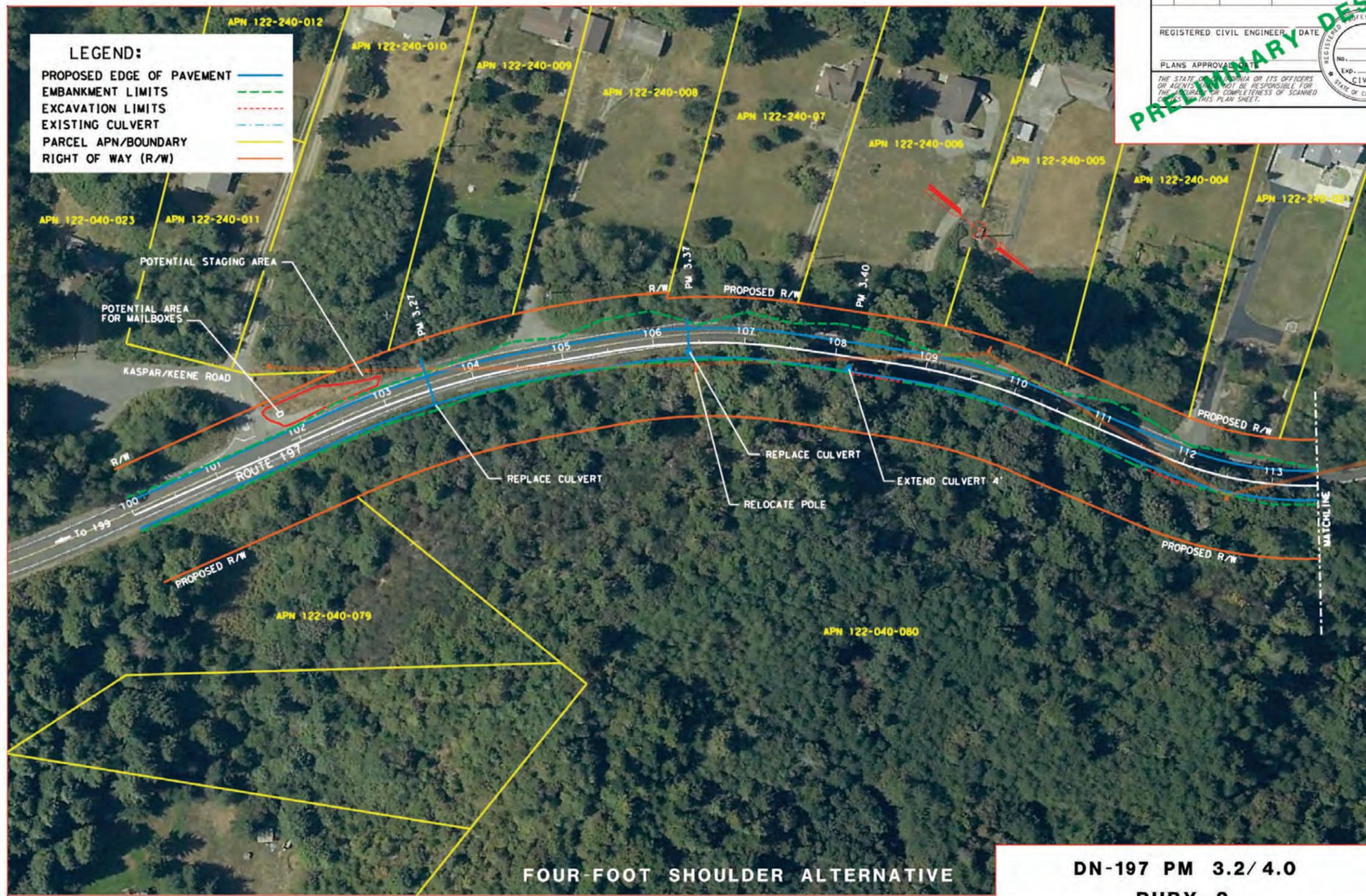
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Figure 1-3
Ruby 1

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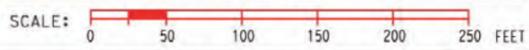
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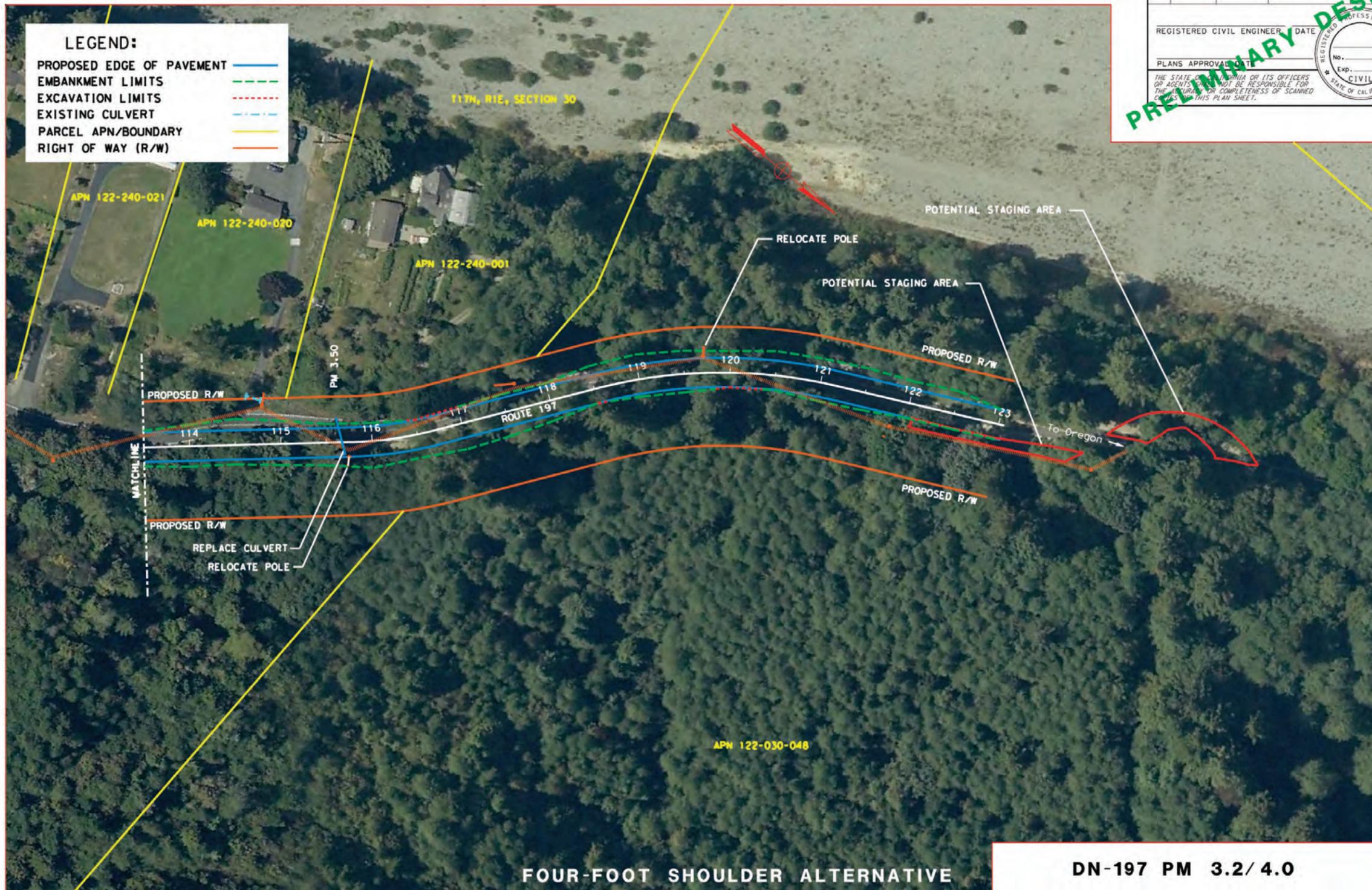
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**Figure 1-4a
Ruby 2, Four-Foot Shoulders**

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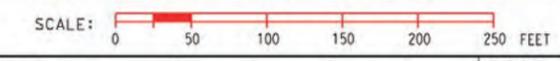
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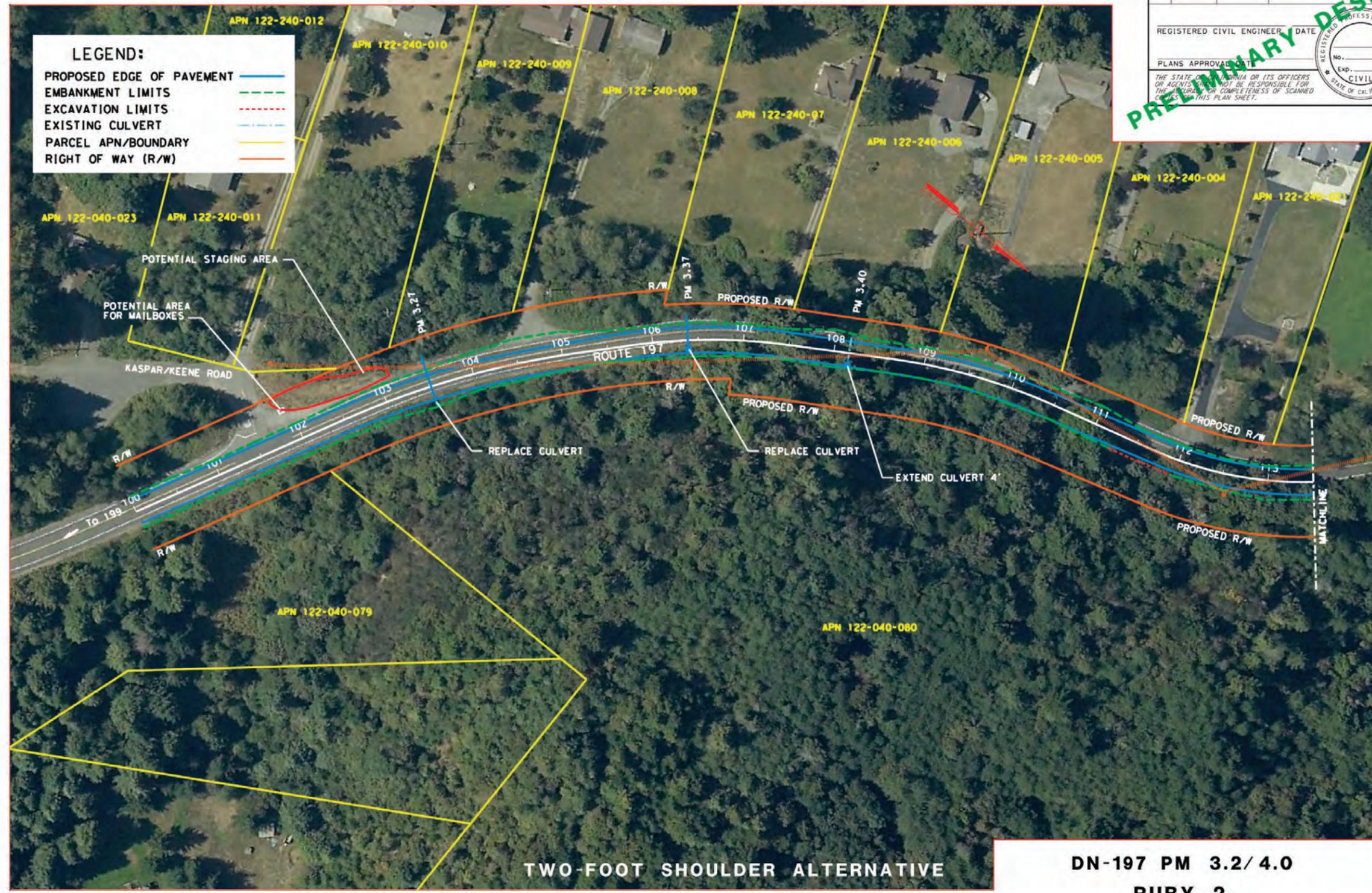
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**Figure 1-4b
Ruby 2, Four-Foot Shoulders**

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 EMBANKMENT LIMITS - - - - -
 EXCAVATION LIMITS - · - · -
 EXISTING CULVERT ———
 PARCEL APN/BOUNDARY ———
 RIGHT OF WAY (R/W) ———

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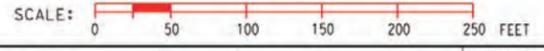
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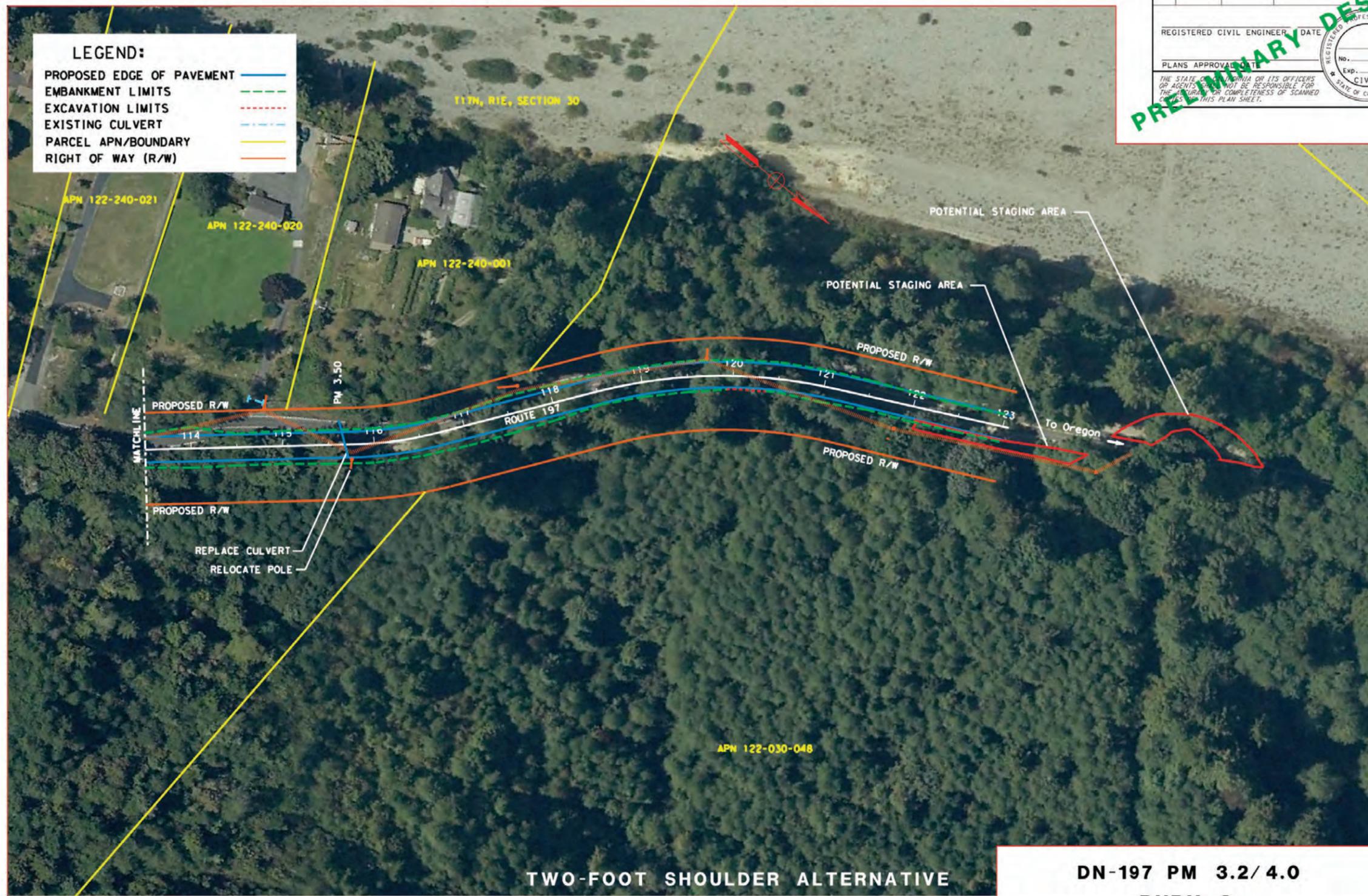
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**Figure 1-5a
 Ruby 2, Two-Foot Shoulders**

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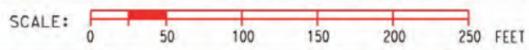
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TWO-FOOT SHOULDER ALTERNATIVE

**DN-197 PM 3.2/ 4.0
RUBY 2**



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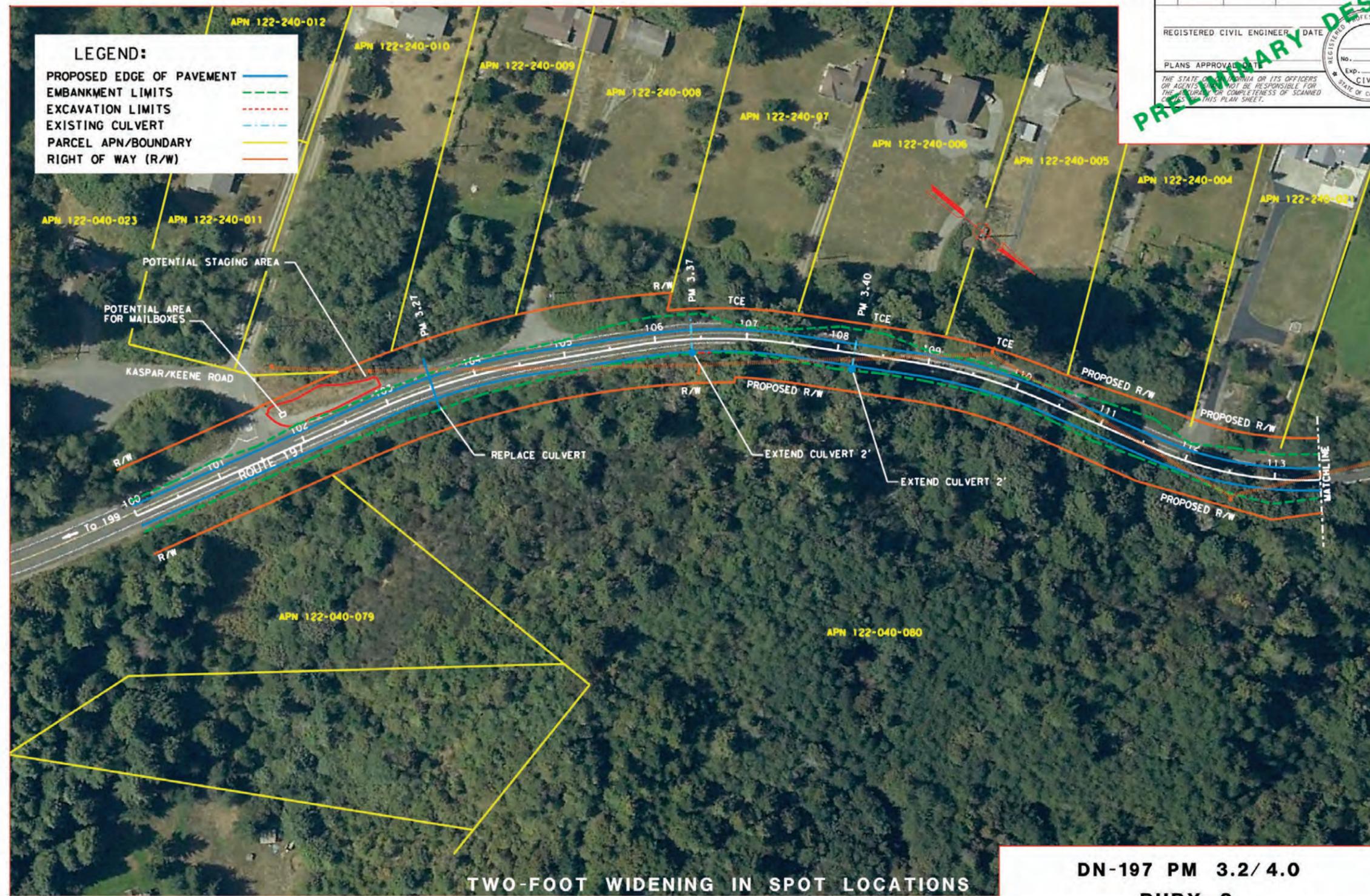
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**Figure 1-5b
Ruby 2, Two-Foot Shoulders**

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PRELIMINARY DESIGN

TWO-FOOT WIDENING IN SPOT LOCATIONS

**DN-197 PM 3.2/ 4.0
RUBY 2**



RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 USERNAME => USER DGN FILE => #REQUEST

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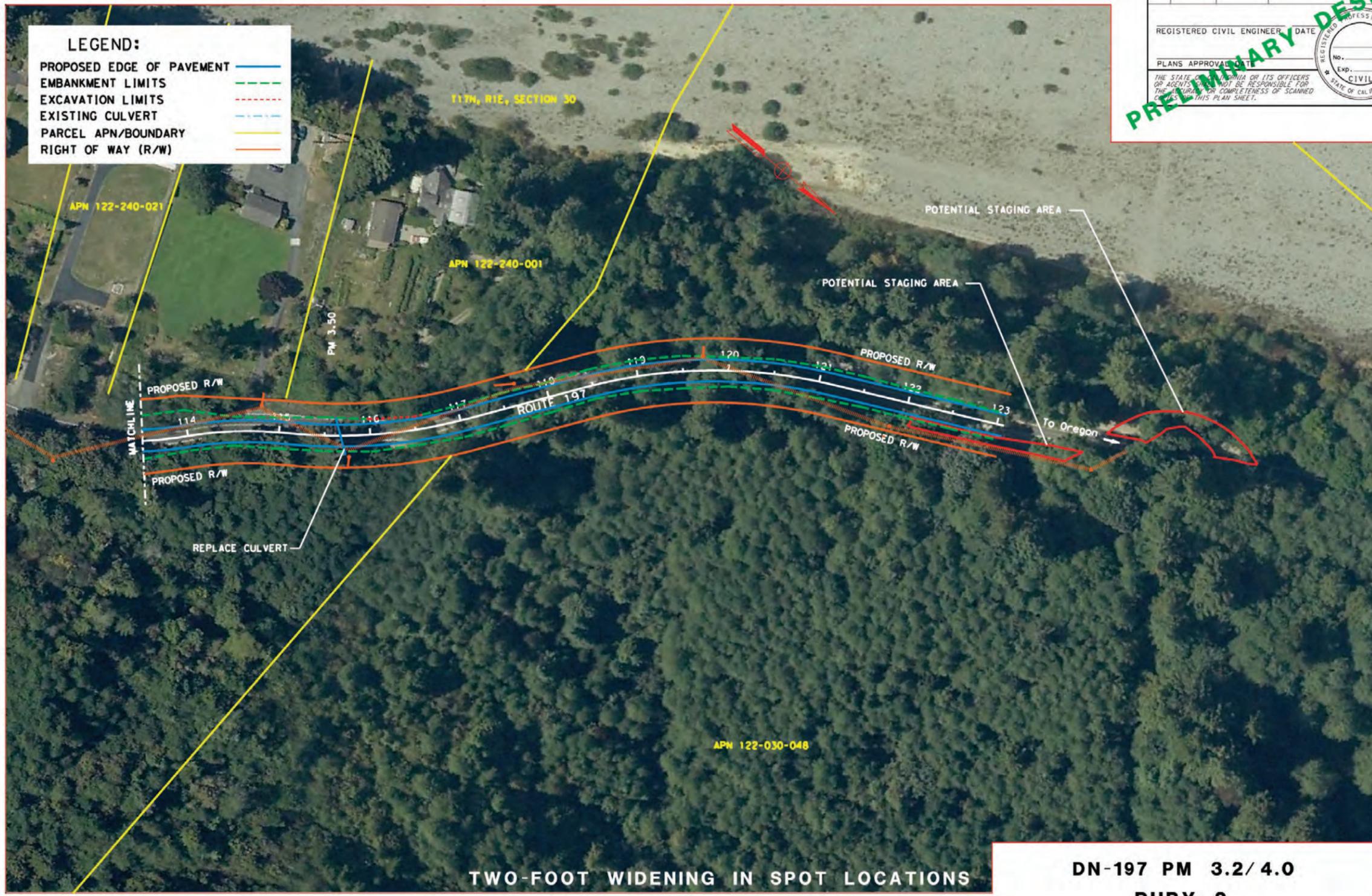
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**Figure 1-6a
Ruby 2, Two-Foot Widening in Spot Locations**

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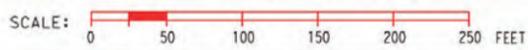
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PRELIMINARY DESIGN

TWO-FOOT WIDENING IN SPOT LOCATIONS



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**DN-197 PM 3.2/ 4.0
RUBY 2**

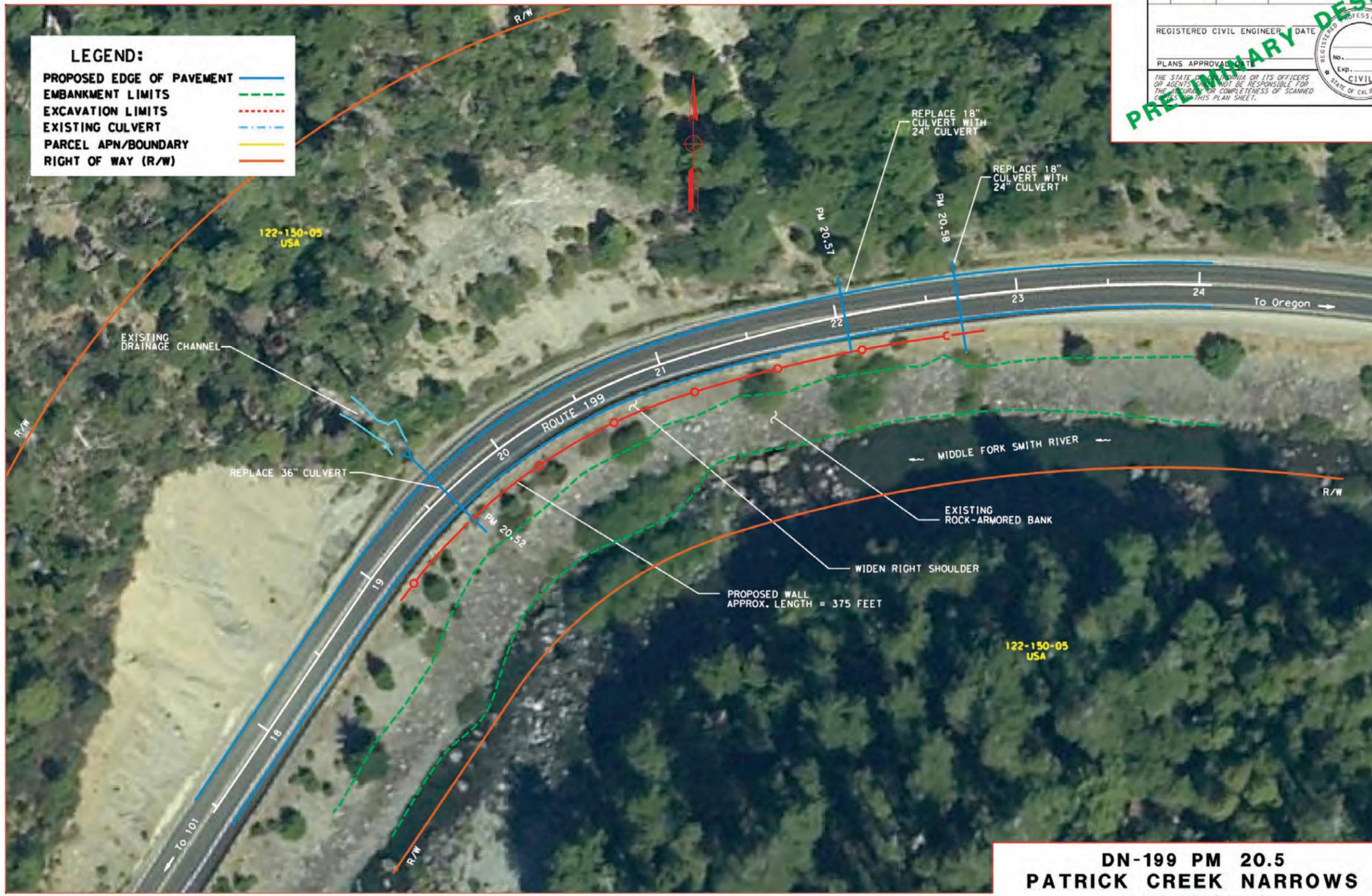
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**Figure 1-6b
Ruby 2, Two-Foot Widening in Spot Locations**

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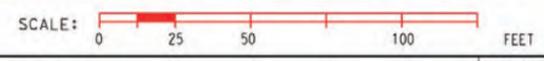
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STATE OF CALIFORNIA

**DN-199 PM 20.5
PATRICK CREEK NARROWS
LOCATION 1**



RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 USERNAME => #USER DGN FILE => #REQUEST

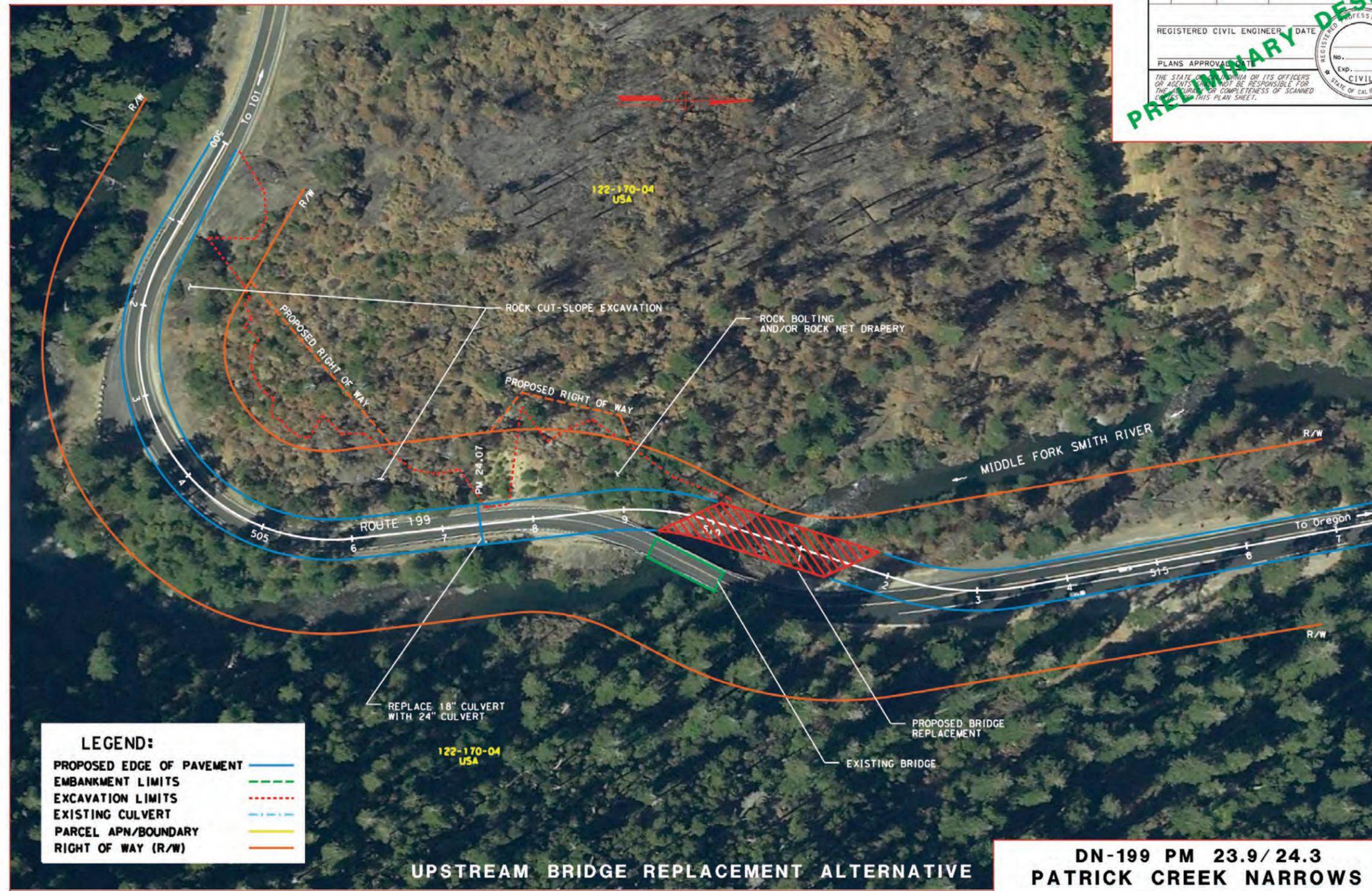
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**Figure 1-7
Patrick Creek Narrows Location 1**

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STATE OF CALIFORNIA

UPSTREAM BRIDGE REPLACEMENT ALTERNATIVE

**DN-199 PM 23.9/24.3
PATRICK CREEK NARROWS
LOCATION 2**



RELATIVE BORDER SCALE IS IN INCHES

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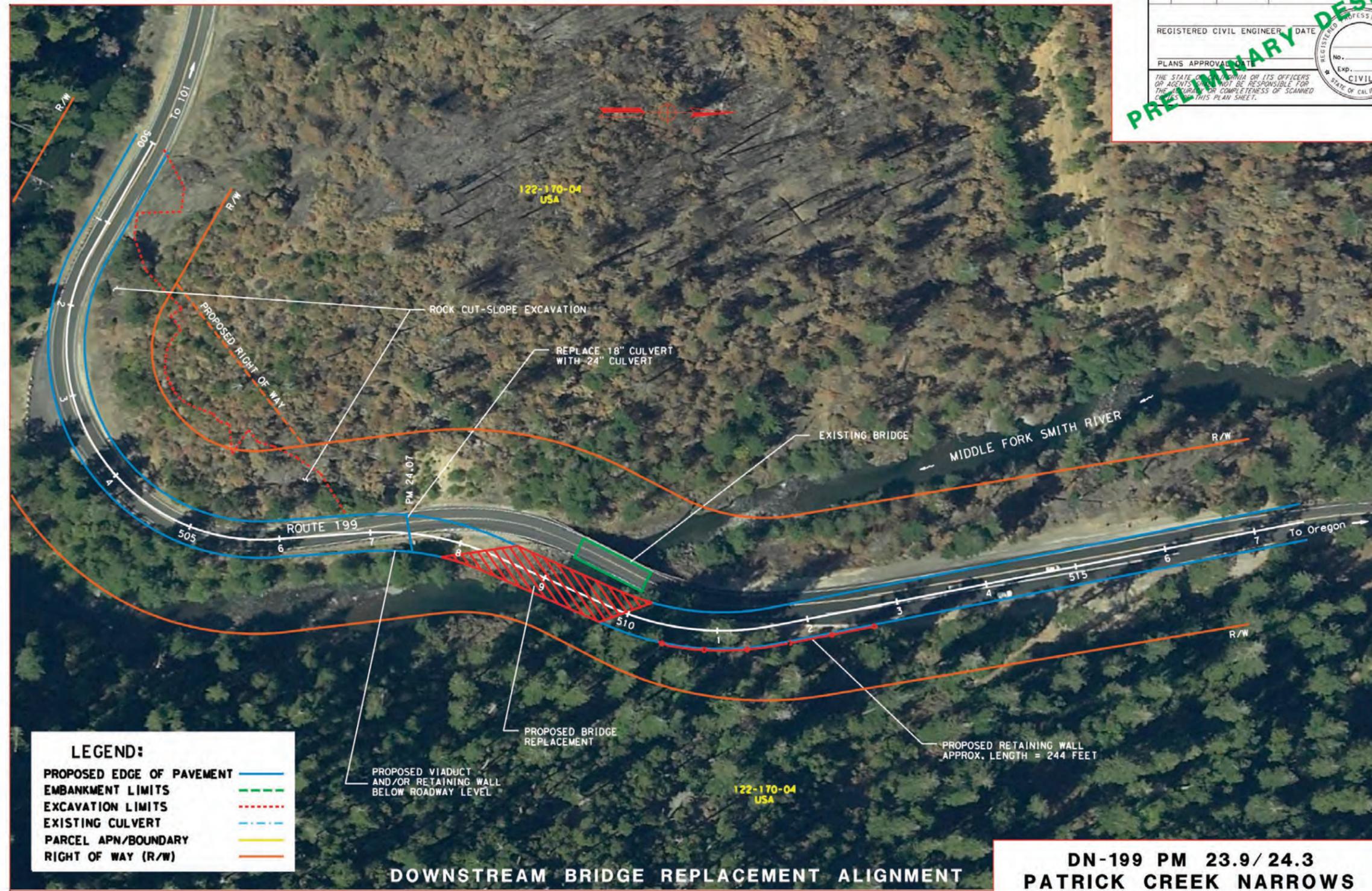
BORDER LAST REVISED 4/11/2008

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**Figure 1-8
Patrick Creek Narrows Location 2
Upstream Bridge Replacement**

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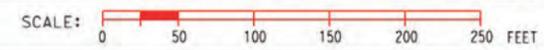


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| PARCEL APN/BOUNDARY | — |
| RIGHT OF WAY (R/W) | — |

DOWNSTREAM BRIDGE REPLACEMENT ALIGNMENT

**DN-199 PM 23.9/ 24.3
PATRICK CREEK NARROWS
LOCATION 2**



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**Figure 1-9
Patrick Creek Narrows Location 2
Downstream Bridge Replacement**

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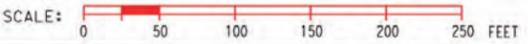
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STATE OF CALIFORNIA

BRIDGE PRESERVATION WITH UPSLOPE RETAINING WALL ALTERNATIVE

**DN-199 PM 23.9/ 24.3
PATRICK CREEK NARROWS
LOCATION 2**



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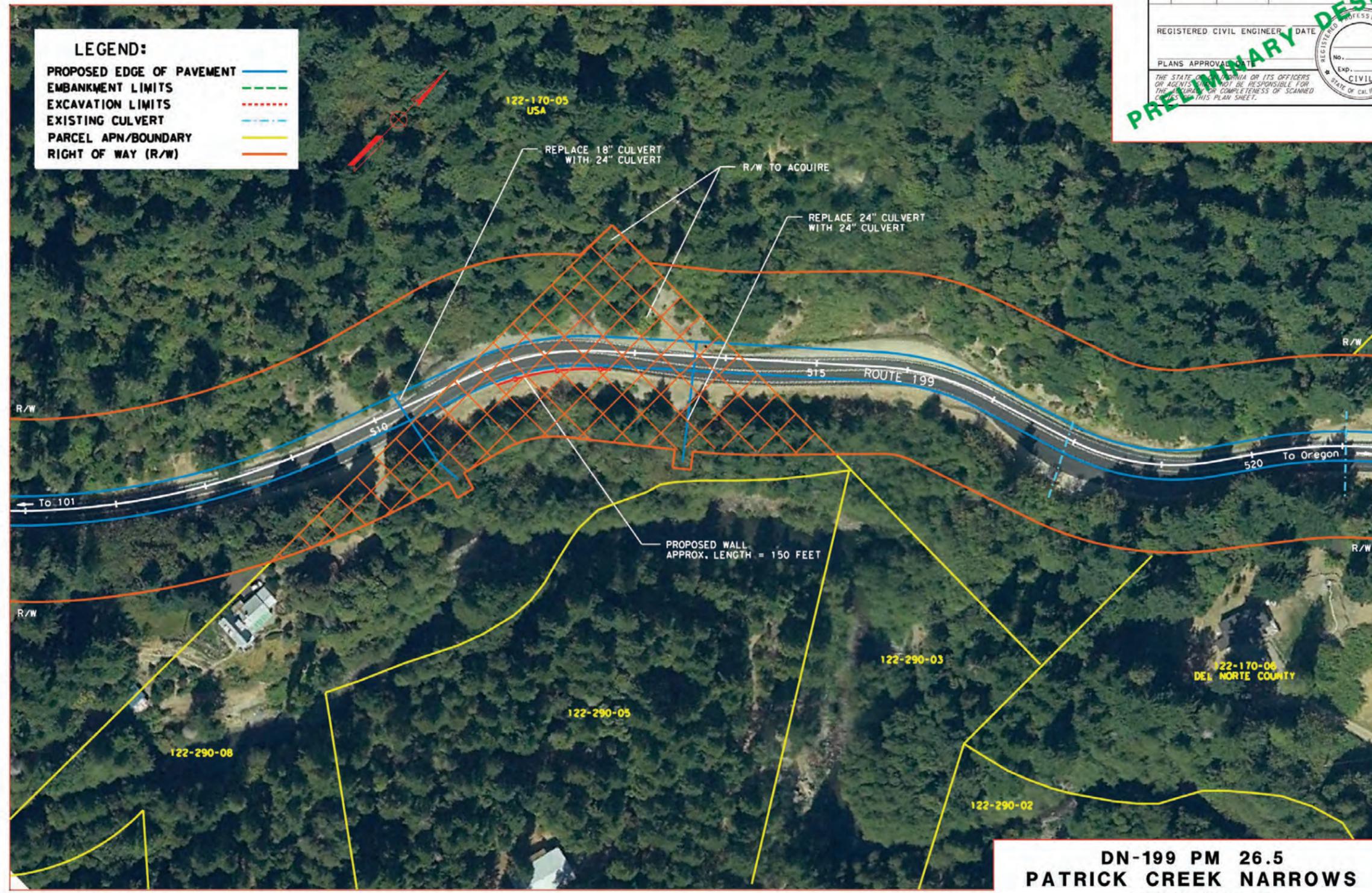
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**Figure 1-10
Patrick Creek Narrows Location 2
Bridge Preservation with Upslope Retaining Wall**

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- EMBANKMENT LIMITS - - - - -
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- EXISTING CULVERT - - - - -
- PARCEL APN/BOUNDARY ———
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CIVIL
STATE OF CALIFORNIA

**DN-199 PM 26.5
PATRICK CREEK NARROWS
LOCATION 3**

SCALE: 0 50 100 150 200 250 FEET

RELATIVE BORDER SCALE 15 IN INCHES 0 1 2 3 USERNAME => USER DGN FILE => #REQUEST

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**Figure 1-11
Patrick Creek Narrows Location 3**

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- EMBANKMENT LIMITS - - - - -
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- EXISTING CULVERT - - - - -
- PARCEL APN/BOUNDARY ———
- RIGHT OF WAY (R/W) ———

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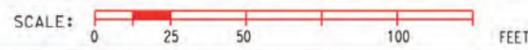
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**DN-199 PM 22.7 / 23.0
THE NARROWS**

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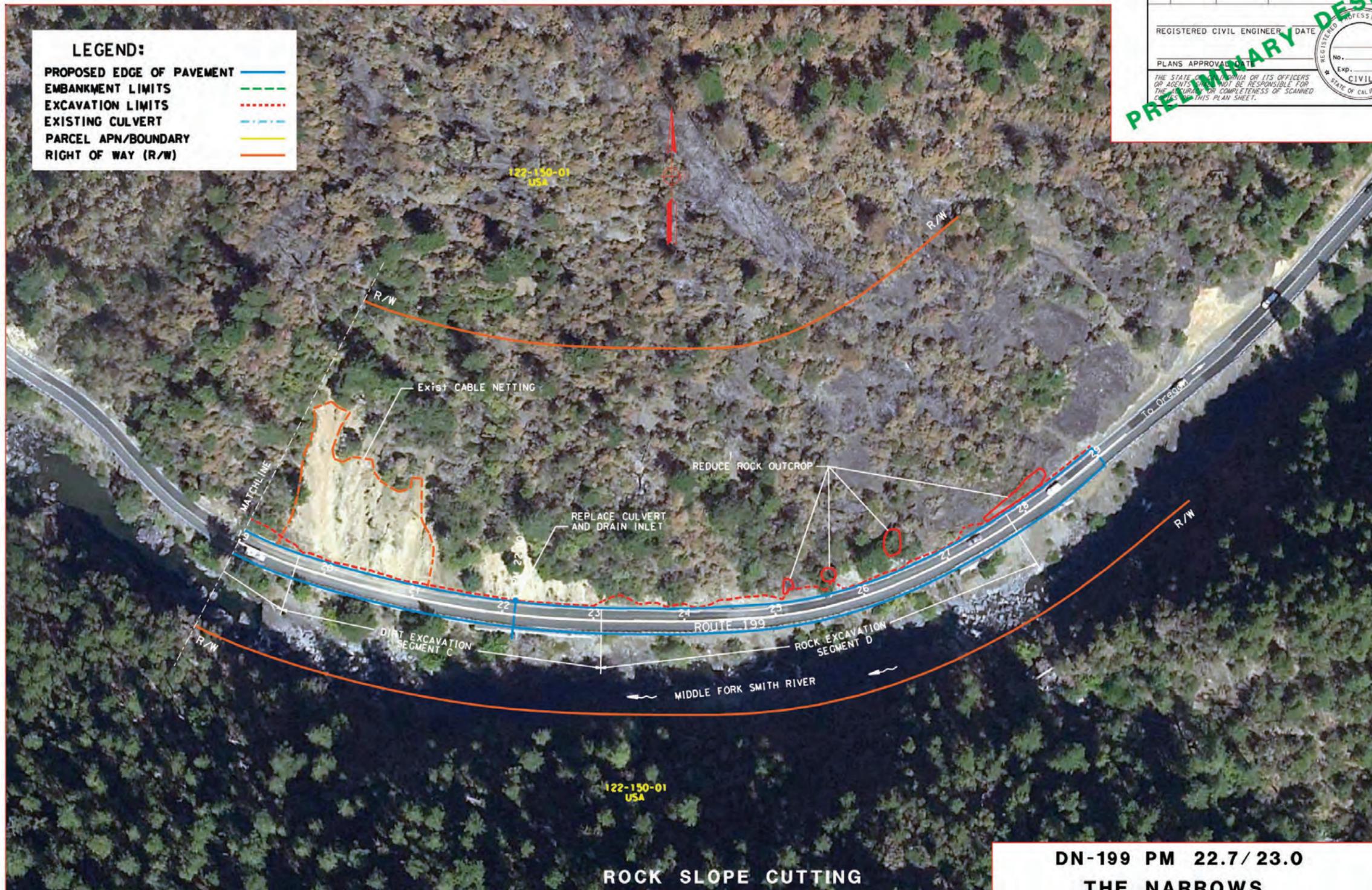
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**Figure 1-12a
The Narrows**

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SCALE: 0 25 50 100 FEET

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THE NARROWS**

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Figure 1-12b The Narrows

2.3 Biological Environment

2.3.1 Natural Communities

This section of the document discusses natural communities of concern. The focus of this section is on biological communities, not individual plant or animal species. This section also includes information on wildlife corridors, fish passage, habitat fragmentation, and re-establishment of native natural community vegetation. Wildlife corridors are areas of habitat used by wildlife for seasonal or daily migration. Habitat fragmentation involves the potential for dividing sensitive habitat, thereby lessening its biological value.

Habitat areas that have been designated as critical habitat under the federal Endangered Species Act are discussed in Section 2.3.5, “Threatened and Endangered Species.” Wetlands and other waters are also discussed in Section 2.3.2, “Wetlands and Other Waters of the United States.”

2.3.1.1 Affected Environment

This section is summarized from the Natural Environment Study (California Department of Transportation 2010), the Addendum to the NES (California Department of Transportation 2012), the *Special-Status Plants Survey Report* (ICF International 2010) and the Forester/Arborist Report (2012).

The study area, also referred to as the Biological Study Area (BSA), includes the Middle Fork and Main Stem of the Smith River within the project vicinity. The proposed area of direct impact (hereafter referred to as area of direct impact) is defined as the area within each of the seven proposed project locations, consisting of Ruby 1, Ruby 2, The Narrows, Patrick Creek Narrows Locations 1, 2, and 3, and Washington Curve in Del Norte County, California, where construction activities are anticipated to affect the surrounding physical environment, generally through disturbance to vegetation and/or the ground/soil surface. Visual and noise impacts may extend beyond the ROW for special status animals; those impacts are addressed in the Noise Study attached to the NES. The BSA includes the Smith River Watershed since it is within and adjacent to the project area and is used as a migration corridor and provides habitat for special status animal species.

The project locations are in forest settings in the California Floristic Province, Northwestern California Region, Klamath Range Subregion (Hickman 1993). The project locations along SR 197 are located adjacent to the north bank of the Smith River, about 5 miles inland from the Pacific Ocean. The sites along US 199 are located in the Six Rivers National Forest (SRNF) Smith River National Recreation Area along the Middle Fork Smith River.

Natural Community Overview

The project locations support several natural vegetation communities, as well as small vegetated seeps and roadside ditches (which could not be assigned to any described community type because of their generally small size and disturbed conditions), and landscaped/disturbed areas.

SR 197 Sites: Ruby 1 Site and Ruby 2 Site

These two sites are located on SR 197 in dense Coast Redwood Forest and dominated by second- and third-growth coast redwood trees (*Sequoia sempervirens*). Associated tree species include Douglas-fir (*Pseudotsuga menziesii* var. *menziesii*), red alder (*Alnus rubra*), and California bay (*Umbellularia californica*). A narrow strip of riparian forest is present along an unnamed stream at the Ruby 2 site and dominated by red alder and willows, predominantly Sitka willow (*Salix sitchensis*) with arroyo willow (*S. lasiolepis*).

Large old redwood trees and large redwood stumps occur along the south side of SR 197 between the edge of the pavement and the north bank of the Smith River. There are fewer large redwood trees along the north side of the highway. The vast majority of the other trees along the north side of the highway represent second- and third-growth timber stands that are managed by industrial timberland owners, primarily Green Diamond Resource Company.

The junction of US 199 and SR 197 near Hiouchi is located just within the boundary of Jedediah Smith Redwoods State Park. SR 197 follows the park boundary for several miles as it heads northwest toward US 101. However, none of the proposed project locations are in or near the park. Ruby Van Deventer County Park is located within the limits of the proposed Ruby 1 site at approximately PM 4.1. The park includes many large redwood trees.

Special aquatic sites can be found at the project locations. Several three-parameter wetlands were delineated within the limits of the proposed Ruby 2 site on SR 197. Both the Ruby 1 and Ruby 2 sites contain riparian wetlands and other waters characterized by ditches and culverts that ultimately outlet into the mainstem of the Smith River. Maps showing the wetlands and other waters can be found in Appendix M.

US 199 Sites: Patrick Creek Narrows (Locations 1, 2, and 3), the Narrows, and the Washington Curve Site

Vegetation on these sites is predominantly Douglas-fir Forest. Douglas-fir is the dominant species in the main canopy and forms a scattered overstory at some sites. Other species typical of the canopy are Pacific madrone (*Arbutus menziesii*), tanoak (*Lithocarpus densiflorus* var. *densiflorus*), canyon live oak (*Quercus chrysolepis*), and big-leaf maple (*Acer macrophyllum*). White alder (*Alnus rhombifolia*) is present along the Middle Fork Smith River and in streams and roadside ditches, often with big-leaf maple and small willows (dbh of less than 6 inches). Small red alder trees are present at Patrick Creek Narrows Location 3. On serpentinite substrates at Patrick Creek Narrows Location 1, Port Orford cedar (*Chamaecyparis lawsoniana*) occurs, but most had a dbh of less than 6 inches. At the Washington Curve site, a small area of knobcone pine (*Pinus attenuata*) is located on the east side of the ridge above US 199.

The communities are described further below, including the project locations where they occur.

Trees

The Department considers trees to be an important resource and attempts to minimize effects on trees. Defining “old growth” trees can be inexact because most definitions discuss forest stand

attributes such as stand structure. Other characteristics distinguishing “old growth” stands include: mixed age stands, great age relative to the species longevity, large trees, complex trunks and tops, multiple layered canopy, and healthy fungal ecosystems. The individual tree characteristics tend to become qualitative, such as broken tops and crown complexity. For this analysis, a single straight forward criteria was selected to determine which individual trees would have special consideration. A guideline often cited for determining the size at which a redwood is considered a large old tree, and thus worthy of special considerations for protection, is a dbh of 36 inches. Legal, regulatory, or other written documentation supporting these criteria have yet to be identified. Nevertheless, state park officials, and staff from other resource agencies routinely use this measurement when assessing impacts on redwoods from projects. For this document these will be referred to as “large, old” trees, whether they are legacy trees from old growth forests or younger second/third growth trees. Large old redwood trees are considered an irreplaceable resource because of their longevity, large diameter, height, the amount of time it takes to achieve their size, the unique micro-ecosystem supported by their upper canopy habitat and less than 5% of the original “old-growth” forest remains uncut. Removal of any large old redwood trees will be considered a significant effect in this analysis. Large redwoods are often considered sensitive because of the limited nature and long regeneration period. While growth rates may vary based on site conditions, a redwood can reach 36 inches dbh in less than 50 years, and trees this large are abundant across the range of redwoods. Thus the 36 inch dbh consideration is a very conservative lower size limit for considering the trees as a sensitive resource.

This analysis does not consider removal of individual trees of other species be significant based on size alone. Other species, such as Douglas-fir, have a much broader range, are shorter lived and have more mature stands remaining across their range, and thus removal of individuals >36 inches DBH will not be a significant impact for this analysis.

In addition to tree removal itself, construction activities could result in other impacts to trees, both long term and short term. Long term impacts to the trees resulting from this project include placement of impervious material, placement of fill over the roots, changing drainage patterns, and compaction of soils. Short term impacts from construction can affect tree roots from such activities as soil disturbance, excavation, compaction, cutting roots, removal of adjacent trees and potential exposure to fuel and oils from leaky equipment.

Of particular concern is construction activity that occurs within the structural root zone of the trees for both long term and short term impacts. The structural root zone is composed of a larger set of roots that physically support the above ground mass of the living tree, and typically considered as the circular area with the tree trunk at the center with a radius equal to 3 times the dbh of the tree. Beyond the structural root zone is the root health zone which extends to 5 times the dbh from the base of the tree. Beyond the structural root zone and root health zone are lateral and absorbing roots which extend past the canopy drip line. These are smaller roots (1-2 inch diameter) which regenerate relatively quickly and support most of the nutrient uptake and water absorption functions for the tree. The possibility of injury to a tree resulting from construction activities generally increases as the distance to the trunk decreases. Additionally, construction activities occurring within the top 3 feet of soil have the greatest potential to impact trees.

These potential effects to trees within and adjacent to the project footprint (ground disturbing project activities) were assessed and detailed in the Forester/Arborist Report (Caltrans 2012). Specialists (Certified Arborist and Registered Professional Forester), visited project sites with large old trees and assessed potential impacts to trees outside the project footprint. Trees were selected for assessment based on whether the project footprint was within 5 times the dbh distance from the tree, referred to as the Potential Effects Zone (PEZ). (Ten times the dbh was used Douglas-fir trees because they are more susceptible to root impacts.) These trees were evaluated based on the proposed project activities (amount of fill, culvert replacement, etc.), and potential effects to the root zone, or from wind, increased light, windthrow, adjacent tree removal, and mechanical damage during construction. Indirect effects due to removal of adjacent trees were considered in the analysis.

Most healthy trees can tolerate removal of up to 50% of their absorbing roots and excavation of up to 30% of the root health zone. Redwoods are rated as having “good” tolerance of construction effects to roots, while Douglas-fir are rated as “poor” tolerance. Lateral and absorbing roots regenerate quickly, up to 10 feet per year. Absorbing roots are ephemeral, living only a few days or weeks in undisturbed conditions. Cut roots can compartmentalize wounds quickly reducing the susceptibility to disease.

Survey Results

The natural communities at the project locations were identified according to DFG’s widely used Vegetation Classification and Mapping Program, the *List of California Terrestrial Natural Communities Recognized by the California Natural Diversity Database* (California Department of Fish and Game 2003) and the 2007 update (California Department of Fish and Game 2007a). The DFG classification is a hierarchical scheme that is based on the vegetation classification system developed for the *Manual of California Vegetation* (MCV) (Sawyer and Keeler-Wolf 1995); it is vegetation-based, emphasizing the natural existing vegetation. There are two floristic levels in the DFG classification system: associations and alliances. Alliances represent an aggregation of associations and are characterized by one or a group of diagnostic species, which often occur in the dominant or uppermost stratum of the vegetation. Associations are characterized by diagnostic species that occur in all strata (overstory and understory) of the vegetation. The diagnostic species used to determine both the alliance and association are primarily the dominant species. For this project, natural communities were identified at the alliance level, because the areas of vegetation within the project locations are generally too small to allow for more detailed characterization of the vegetation to a lower (i.e., association) level.

The vegetation communities are described below. The locations of the communities in the project area are shown on maps in Appendix J. The area of each community at each project site is listed in Table 2.3.1-1.

Table 2.3.1-1. Area of Natural Communities at Each Project Site

| Community | Area (acres) | | | | | | |
|---|--------------|-------------|----------------------------------|----------------------------------|----------------------------------|-------------|-----------------------|
| | Ruby 1 Site | Ruby 2 Site | Patrick Creek Narrows Location 1 | Patrick Creek Narrows Location 2 | Patrick Creek Narrows Location 3 | The Narrows | Washington Curve Site |
| Douglas-Fir Forest | 0 | 0 | 1.70 | 2.88 | 2.48 | 0 | 2.02 |
| Coast Redwood Forest | 0.48 | 1.81 | 0 | 0 | 0 | 0 | 0 |
| Knobcone Pine Forest | 0 | 0 | 0 | 0 | 0 | 0 | 0.54 |
| White Alder Forest and Woodland | 0 | 0 | 0 | 0.38 | 0 | 0 | 0 |
| Red Alder Forest | 0 | 0.23 | 0 | 0 | 0.15 | 0 | 0 |
| Bigleaf Maple Forest | 0 | 0 | 0 | 0 | 0.80 | 0 | 0 |
| Emergent Wetlands, including Roadside Seeps and Drainages | 0.006 | 0.105 | 0.092 | 0.005 | 0.087 | 0.007 | 0.012 |
| Riverine | 0 | 0 | 0 | 0.707 | 0 | 0 | 0 |
| Ruderal/Disturbed | 0.1 | 1.0 | 0.1 | 0.5 | 0.9 | 0.1 | 0.6 |
| Sparsely Vegetated | 0 | 0 | 2.0 | 1.26 | 0.57 | 1.27 | 0.69 |

Douglas-Fir Forest

Douglas-fir Forest is the dominant vegetation community in the vicinity of the Patrick Creek Narrows Locations 1, 2, and 3 and Washington Curve site US 199 project locations; it occurs in the staging areas at PMs 19.8, 20.19, 22.11, 23.15, 23.92, 25.00, 25.68, and 26.15. This community is characterized by a well-developed overstory dominated by Douglas-fir trees (*Pseudotsuga menziesii* var. *menziesii*), often with a dense main canopy below. Trees commonly observed in the main canopy were Pacific madrone (*Arbutus menziesii*), tanoak (*Lithocarpus densiflorus* var. *densiflorus*), big-leaf maple (*Acer macrophyllum*), and canyon live oak (*Quercus chrysolepis*). The shrub layer ranges from sparse to relatively dense. In mesic areas, Himalayan blackberry (*Rubus armeniacus*, formerly *R. discolor*) was present. In drier areas, the representative understory shrubs were black huckleberry (*Vaccinium ovatum*), creeping honeysuckle (*Lonicera hispidula*), poison-oak (*Toxicodendron diversilobum*), California blackberry (*Rubus ursinus*), and wood rose (*Rosa gymnocarpa*). The herbaceous understory of this community was typically sparse but diverse; the representative species observed were sword fern (*Polystichum munitum*), wood strawberry (*Fragaria vesca*), hairy woodrush (*Luzula comosa*), and yerba de selva (*Whipplea modesta*). At the Washington Curve site, where Douglas-fir Forest occupied the west side of the ridge, mycotrophs² were common, including candystick (*Allotropa virgata*), California groundcone (*Boschniakia strobilacea*), and coralroot orchid (*Corallorhiza* sp.). At Patrick Creek Narrows Location 2, much of the Douglas-fir Forest west of the road was burned in a wildfire, and many of the overstory and canopy trees are dead and had a sparse understory.

Three special-status plants with California Rare Plant Rank (CRPR)³ 1B and 2 (formerly California Native Plant Society [CNPS], Lists 1B and 2) were found in this habitat: Coast Range

² Mycotrophs, also called saprophytes, are specialized plants that derive their nutrients from close association with a mycorrhizal fungus.

³ “In March, 2010, DFG changed the name of “CNPS List” or “CNPS Ranks” to “California Rare Plant Rank” (or CRPR). [CNPS made the name change in 2011.] This was done to reduce confusion over the fact that CNPS and DFG jointly manage the Rare Plant Status Review groups (300+ botanical experts from government, academia,

lomatium (*Lomatium martindalei*), yellow-tubered toothwort (*Cardamine nuttalli* var. *gemma*). Siskiyou iris (*Iris bracteata*), which is ranked as a CRPR 3, was also found in this habitat. The Douglas-fir Forest community is common and widespread and is not recognized as sensitive by the CNDDDB (California Department of Fish and Game 2003).

Coast Redwood Forest

Coast Redwood Forest is the dominant vegetation community at the SR 197 sites: Ruby 1 site and Ruby 2 site and associated staging areas at PMs 4.05 and 4.02. At the project locations, this community is dominated by second- or third-growth coast redwood trees (*Sequoia sempervirens*), with residual large old redwood trees and stumps that form a very dense canopy. Associated tree species are found in the understory and include Douglas-fir, red alder (*Alnus rubra*), and California bay (*Umbellularia californica*). The shrub layer typically is dense and well developed and includes black huckleberry and red huckleberry (*Vaccinium parvifolium*). Common herbaceous components of the understory include sword fern and redwood sorrel (*Oxalis oregana*).

No special-status or rare plants were found in this habitat. This community is common and widespread and is not recognized as sensitive by the CNDDDB (California Department of Fish and Game 2003).

Knobcone Pine Forest

Knobcone Pine Forest occurs only at the Washington Curve site, on the eastern side of the ridge on the north side of the road. This community has a relatively open canopy of knobcone pine (*Pinus attenuata*), with associated Douglas-fir and canyon live oak. The shrub layer is very dense and dominated by black huckleberry and hairy manzanita (*Arctostaphylos columbiana*). Because of the dense shrub layer, few herbaceous plants are present.

Two CRPR 4 plants were found adjacent to this community at the Washington Curve site, Piper's blue grass (*Poa piperi*) and slender false lupine (*Thermopsis gracilis* var. *gracilis*). Siskiyou iris (*Iris bracteata*), which is ranked as a CRPR 3, was also found in this habitat. This community is common and widespread and is not recognized as sensitive by the CNDDDB (California Department of Fish and Game 2003).

White Alder Forest and Woodland

This riparian community occurs at Patrick Creek Narrows Location 2 as a narrow band along the Middle Fork Smith River. The canopy is dominated by white alder, typically forming a closed canopy; associated trees include big-leaf maple and arroyo willow (*Salix lasiolepis*). Typically,

NGOs and the private sector) and that the rank assignments are the product of a collaborative effort and not solely a CNPS assignment. The old name gave the false impression that CNPS solely assigned the ranks and had excessive influence on the regulatory process. [DFG] did this in consultation and agreement with the CNPS Executive Director and the CNPS Board of Directors. Nothing about the actual process of rare plant review or rank assignment has changed and the same committee of experts from many organizations in addition to DFG and CNPS still review each change and ultimately assign the ranks" (California Department of Fish and Game California Natural Diversity Database, May 2012, Special Vascular Plants, Bryophytes, and Lichens list; see <http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/SPPlants.pdf> accessed on 6/28/12). Also, see *The Rare, Threatened, and Endangered Plants of California, Glossary of Terms and Field Descriptions* at <http://www.rareplants.cnps.org/glossary.html>, accessed 6/14/12.

the herbaceous layer is diverse. Mosses are prominent, and associated species include western boykinia (*Boykinia occidentalis*), wood saxifrage (*Saxifraga mertensiana*), bowl clover (*Trifolium cyathiferum*), and torrent sedge (*Carex nudata*).

Two CRPR 4 plants were found in this community, Siskiyou daisy (*Erigeron cervinus*) and Howell's saxifrage (*Saxifraga howellii*). This community is common and widespread and not recognized as sensitive by the CNDDDB (California Department of Fish and Game 2003). DFG jurisdiction is often extended to habitats adjacent to watercourses that function hydrologically as part of the riparian system (California Fish and Game Code Section 2785[e]).

Red Alder Forest

This riparian community is present along the stream at the Ruby 2 site. The community has an overstory of red alder (*Alnus rubra*), with a dense canopy below that is dominated by willows (*Salix* spp.), predominantly Sitka willow (*Salix sitchensis*). The understory consists of shrubs and vines, including Himalayan blackberry (*Rubus armeniacus*, formerly *R. discolor*), California blackberry (*Rubus ursinus*), and twinberry (*Lonicera involucrata* var. *ledebourii*), and herbaceous plants such as lady fern (*Athyrium filix-femina*) and piggy-back plant (*Tolmiea menziesii*). A few red alder trees also occur along the roadside ditch at Patrick Creek Narrows Location 3.

No special-status or rare plants were found in this habitat. This community is common and widespread and not recognized as sensitive by the CNDDDB (California Department of Fish and Game 2003). DFG jurisdiction is often extended to habitats adjacent to watercourses that function hydrologically as part of the riparian system (California Fish and Game Code Section 2785[e]).

Bigleaf Maple Forest

Bigleaf Maple Forest occurs at Patrick Creek Narrows Location 3 where it borders the creek on the uphill side of the road and at the base of the road bank below the road. This community has a dense canopy of bigleaf maple and a dense herb layer that is dominated by sword fern and miner's lettuce (*Claytonia* spp.). This community is a proposed alliance (California Department of Fish and Game 2007b). No special-status or rare plants were found in this habitat. It is common and widespread and is not recognized as sensitive by the CNDDDB (California Natural Diversity Database 2009). DFG jurisdiction is often extended to habitats adjacent to watercourses that function hydrologically as part of the riparian system (California Fish and Game Code Section 2785[e]).

Darlingtonia Seep

The California pitcherplant (*Darlingtonia californica*) can be found in wetland habitats that are saturated with running water (Darlingtonia seeps). A small Darlingtonia seep occurs at the west end of the Patrick Creek Narrows Location 1 site on the north side of road. The seep is beyond the proposed limits of construction; therefore, it is not included as being in the project locations.

The tree canopy consists of mixed hardwoods and conifers, including tanoak, Pacific madrone, and Port Orford cedar (*Cupressus lawsoniana*). The shrub layer around the seep is dense and supports a variety of shrubs, including western Labrador tea (*Ledum glandulosum*) and western azalea (*Rhododendron occidentale*).

Numerous California pitcherplants (CRPR 4.2) occur in the dense understory, and one special-status plant, horned butterwort (*Pinguicula macroceras*) (CRPR 2.2), was observed at the edge of the stream that flows from the Darlingtonia seep. This community type is recognized as sensitive by the CNDDDB (California Department of Fish and Game 2003) and has a global conservation status rank of G4 and a state rank of S3.2 (See Appendix N for a discussion of global and state conservation rankings).

Emergent Wetlands, Including Roadside Seeps and Drainages

Two small areas of emergent wetland are present at the Ruby 2 site. Roadside ditches supporting emergent hydrophytic vegetation are present at Patrick Creek Narrows Locations 1, 2, and 3, and the Narrows site. In general, these areas were small and often disturbed by road shoulder maintenance (and residential maintenance at the Ruby 2 site). The vegetation could not be assigned to any described vegetation community type. Representative species observed in roadside ditches were Bolander's rush (*Juncus bolanderi*), swordleaf rush (*Juncus ensifolius*) and other rush species, seep monkeyflower (*Mimulus guttatus*), giant horsetail (*Equisetum telmateia* ssp. *braunii*), and fall panic grass (*Panicum capillare*). Representative species observed immediately adjacent to the ditches included birdsfoot trefoil (*Lotus corniculatus*), tall fescue (*Festuca arundinacea*), and rush species (*Juncus* spp.). One of the wetlands at the Ruby 2 site supports water parsley (*Oenanthe sarmentosa*), small-flowered bulrush (*Scirpus microcarpus*), and lady fern and appears to be regularly mown. At Patrick Creek Narrows Location 2, a small ephemeral roadside seep southwest of the bridge is dominated by western coltsfoot (*Petasites frigidus* var. *palmatus*). The roadside ditch at Patrick Creek Narrows Location 3 supports scattered red alder and willow trees. Serpentinite substrates influence the seeps and roadside ditches at Patrick Creek Narrows Location 1.

Emergent wetlands at Patrick Creek Narrows Location 1 and the Narrows site support sensitive plant species. The serpentine seep habitats at Patrick Creek Narrows Location 1 support two CRPR 4 plants, California lady's slipper (*Cypripedium californicum*) and Del Norte willow (*Salix delnortensis*). These wetland communities may be considered jurisdictional by the U.S. Army Corps of Engineers (USACE) and are delineated and described in more detail in Section 2.3.2, "Wetlands and Other Waters of the United States." A rocky roadside seep at the east end of the Narrows site supports a small population of California lady's slipper.

Riverine

Riverine habitat includes rivers and streams. These features originate at high elevations and flow toward lower elevations. The Middle Fork Smith River flows through Patrick Creek Narrows Location 2. Here the Middle Fork Smith River is approximately 40 feet wide. No special-status or rare plants were found in this habitat.

Ruderal /Disturbed

Ruderal vegetation occurs along the road shoulders and on vegetated cut banks at each of the seven project locations and associated staging areas. Most of the commonly occurring plants are nonnatives such as perennial sweet pea (*Lathyrus latifolius*), hairy cat's-ear (*Hypochaeris radicata*), bur-clover (*Medicago polymorpha*), wild oats (*Avena* spp.), tall fescue (*Festuca arundinacea*), chicory (*Cichorium intybus*), and bromes (*Bromus diandrus* and *B. hordeaceus*). Noxious weeds such as yellow star-thistle (*Centaurea solstitialis*), French broom (*Genista*

monspessulana), Scotch broom (*Cytisus scoparius*), and spotted knapweed (*Centaurea maculosa*) occur in these areas. No special-status or rare plants were found in this habitat.

Sparsely Vegetated Communities

Sparsely vegetated communities occur at the Patrick Creek Narrows Location 1, the Narrows, and the Washington Curve sites on roadside cut banks and cliffs. At Patrick Creek Narrows Location 1, the steep cut bank provides a large area of bare serpentine rock and soil. The vegetation consists of scattered Port Orford trees and saplings as well as a variety of forbs such as woolly sunflower (*Eriophyllum lanatum* var. *achilleoides*) and Bridges' brodiaea (*Triteleia bridgesii*). Below the road at Patrick Creek Narrows Location 1, the slope has been stabilized with rock concrete that stretches from the road level almost down to the Middle Fork Smith River. Typical trees here are scattered Douglas-fir, incense cedar (*Calocedrus decurrens*), and bigleaf maple; forbs include wild carrot (*Daucus carota*) and naked buckwheat (*Eriogonum nudum*). At the Narrows site, the steep rocky cliff face supports scattered canyon live oak and a variety of native forbs such as California fuchsia (*Epilobium canum* ssp. *latifolium*) and cliff maids (*Lewisia cotyledon* var. *cotyledon*).

At Patrick Creek Narrows Location 1, a CRPR 4 plant, Howell's lomatium (*Lomatium howellii*), occurs on sparsely-vegetated serpentinite substrates. Also at Patrick Creek Narrows Location 1, Piper's blue grass (*Poa piperi*) occurs on the roadside bank below the road. At the Narrows site, Del Norte willow was recorded at the base of the steep bank above the road. At the Washington Curve site, the steep soil cut bank adjacent to the Knobcone Pine Forest community supports a small patch of the CRPR 4 slender false lupine (*Thermopsis gracilis* var. *gracilis*) and Piper's blue grass. Siskiyou iris (*Iris brateata*), which is ranked as a CRPR 3, was also found in this habitat at Patrick Creek Narrows Location 1, the Narrows, and Washington Curve.

Tree Surveys

Surveys for trees were conducted at the Ruby 1 site; Ruby 2 site; Patrick Creek Narrows Locations 1, 2, and 3; and the Washington Curve site on February 23, 24, and 25, 2009. A survey was conducted for trees at the Narrows during a Department lane closure on May 21, 2009. The trees to be mapped were defined as any living tree with at least one trunk with a dbh of 6 inches or more. In December 2011, additional tree surveys at the project sites were conducted by a Registered Professional Forester and an ISA (International Society of Arboriculture) certified Arborist.

Ruby 1 Site

Department survey crews measured 72 trees with a dbh of 1 foot or more within 40 feet of the existing roadway at the Ruby 1 site. The measured trees included alder, redwood, and California bay.

Tree surveys were conducted at the Ruby 1 site on February 22, 2009, and identified 13 trees, which are in addition to those identified during the Department's tree surveys. The additional trees included 11 with a dbh of less than 12 inches. The species found during this survey included California bay, redwood, and white alder.

The Arborist and Forester team conducted surveys at the Ruby 1 site on December, 2011, and evaluated potential effects to 57 individual trees and clumps of trees.

Ruby 2 Site

Department survey crews measured 270 trees with a dbh of 10 inches or more within 100 feet of the existing roadway at the Ruby 2 site. The measured trees included alder, big-leaf maple, redwood, and California bay.

Tree surveys were conducted at the Ruby 2 site on February 22, 2009, and identified 48 trees, which are in addition to those identified during the Department's tree surveys. The additional trees included 46 with a dbh of less than 12 inches. The species found in this survey included California bay, redwood, big-leaf maple, incense cedar, Douglas-fir, and white alder.

The Arborist and Forester team conducted surveys at the Ruby 2 site in December, 2011, and evaluated potential effects to 91 individual trees and clumps of trees.

Patrick Creek Narrows Location 1

Tree surveys were conducted between February 23 and 25, 2009, and identified 24 trees at Patrick Creek Narrows Location 1. The measured trees included eight with a dbh of less than 12 inches. The species included white alder, Pacific madrone, incense cedar, tanoak, Port Orford cedar, Douglas-fir, and canyon live oak.

Patrick Creek Narrows Location 2

Tree surveys were conducted between February 23 and 25, 2009, and identified 218 trees at Patrick Creek Narrows Location 2. The measured trees included 73 with a dbh of less than 12 inches. The species included big-leaf maple, white alder, Pacific madrone, tanoak, Douglas-fir, canyon live oak, redwood, and California bay.

The Arborist and Forester team conducted surveys at the Patrick Creek Narrows Location 2 in December, 2011, and evaluated potential effects to individual trees and clumps of trees along the roadside and within the hillside cut slope area.

Patrick Creek Narrows Location 3

Tree surveys were conducted between February 23 and 25, 2009, and identified 36 at Patrick Creek Narrows Location 3. The measured trees included 14 with a dbh of less than 12 inches. The species included big-leaf maple, tanoak, Douglas-fir, and canyon live oak.

The Narrows

Tree surveys were conducted between February 23 and 25, 2009, and identified five trees at the Narrows. All five trees identified had a dbh of less than 12 inches. The species included Pacific madrone, Douglas-fir and canyon live oak.

Washington Curve Site

Tree surveys were conducted between February 23 and 25, 2009, and identified 157 trees at the Washington Curve site. The measured trees included 33 with a dbh of less than 12 inches. The species included white alder, tanoak, knobcone pine, Douglas-fir, and canyon live oak.

The Arborist and Forester team conducted surveys at the Washington Curve Site in December, 2011, and evaluated potential effects to individual trees and clumps of trees within the hillside cut slope area.

Wildlife Corridors and Fish Passage

The state and federally threatened marbled murrelet, discussed in more detail in Section 2.3.5, “Threatened and Endangered Species,” uses the canyon of the Middle Fork Smith River as a migration and dispersal corridor. The Middle Fork Smith River is habitat for anadromous fish species and provides passage. None of the unnamed tributaries that would be modified support fish passage. They are all too steep. The project locations are adjacent to rivers that attract many terrestrial animal species; therefore, the entire area supports terrestrial wildlife crossings.

Natural Community Habitat Connectivity

Roads and highways create a barrier effect for wildlife movement, resulting in habitat fragmentation and habitat loss, the two leading causes of species decline. Habitat fragmentation occurs when highways are built in wildlife habitat, effectively barring natural ecological processes and movement.

Re-establishment of Native Natural Community Vegetation

Construction of the project will result in ground disturbance and clearing areas that are currently vegetated. These areas will need to be revegetated or planted for erosion control, aesthetic purposes, or mitigation. Erosion control seeding and revegetation will be designed to encourage re-establishment of regionally appropriate, native vegetation within the natural communities from which the vegetation was removed. Revegetation minimizes bare ground available for establishment of invasive plant species, helps maintain natural ecological processes, and minimizes habitat fragmentation and loss.

2.3.1.2 Environmental Consequences

Effects on Natural Communities

Construction of the proposed improvements would result in temporary and permanent impacts on natural communities at each project site. The area of natural communities affected at each location, by alternative, when applicable, is quantified in the tables below. Construction activities would also temporarily disturb natural communities. The area of temporary disturbance is included in the tables. Construction impacts are discussed in detail in Section 2.4, “Construction Impacts.” Temporary effects include disturbances to plants and animals that are short term (1-2 years). Temporary impacts are typically due to activities of construction. If the effect is temporary, the pre-construction natural community is expected to re-establish (either by recolonization or planting/seeding) within 2 years after construction is complete. Temporary impacts include stream diversion and associated sediment discharges, soil excavation for trenching, and noise of construction (including blasting). Permanent effects include disturbances to plants and animals that are more long-term impacts (more than 2 years) or perpetual. This includes removal of mature trees, extending the length of culverts, and addition of impervious surface. Some permanent effects may be beneficial to natural communities, such as the removal of bridge piers from a river channel.

Table 2.3.1-2. Area of Natural Communities Affected at the Ruby 1 Site

| Community | Area Permanently Affected (acres) | Area Temporarily Affected (acres) |
|----------------------|-----------------------------------|-----------------------------------|
| Coast Redwood Forest | 0.05 | 0 |
| Waters/Wetlands | 0.004 | 0.002 |
| Ruderal/Disturbed | 0.1 | 0.05 |

Table 2.3.1-3. Area of Natural Communities Affected at the Ruby 2 Site

| Community | Alternative | Area Permanently Affected (acres) | Area Temporarily Affected (acres) |
|----------------------|-------------------------------------|-----------------------------------|-----------------------------------|
| Coast Redwood Forest | Four-Foot Shoulder | 0.55 | 0 |
| | Two-Foot Shoulder | 0.41 | 0 |
| | Two-Foot Widening in Spot Locations | 0.09 | 0 |
| Waters/Wetlands | Four-Foot Shoulder | 0.009 | 0.006 |
| | Two-Foot Shoulder | 0.009 | 0.006 |
| | Two-Foot Widening in Spot Locations | 0.009 | 0.006 |
| Red Alder Forest | Four-Foot Shoulder | 0.05 | 0 |
| | Two-Foot Shoulder | 0.06 | 0 |
| | Two-Foot Widening in Spot Locations | 0.06 | 0 |
| Ruderal/Disturbed | Four-Foot Shoulder | 0.4 | 0.3 |
| | Two-Foot Shoulder | 0.2 | 0.2 |
| | Two-Foot Widening in Spot Locations | 0.1 | 0.3 |

Table 2.3.1-4. Area of Natural Communities Affected at Patrick Creek Narrows Location 1

| Community | Area Permanently Affected (acres) | Area Temporarily Affected (acres) |
|--------------------------|-----------------------------------|-----------------------------------|
| Douglas-Fir Forest | 0.01 | 0 |
| Darlingtonia Seep | 0 | 0 |
| Waters/Wetlands | 0.03 | 0.04 |
| Ruderal/Disturbed | 0.01 | 0.04 |
| Sparsely Vegetated Slope | 0.10 | 0 |

Table 2.3.1-5. Area of Natural Communities Affected at Patrick Creek Narrows Location 2

| Community | Alternative | Area Permanently Affected (acres) | Area Temporarily Affected (acres) |
|---------------------------------|---|-----------------------------------|-----------------------------------|
| Douglas-Fir Forest | Upstream Bridge Replacement | 1.0 | 0 |
| | Downstream Bridge Replacement | 1.0 | 0 |
| | Bridge Preservation with Upslope Retaining Wall | 0.5 | 0 |
| White Alder Forest and Woodland | Upstream Bridge Replacement | 0 | 0 |
| | Downstream Bridge Replacement | 0 | 0 |
| | Bridge Preservation with Upslope Retaining Wall | 0 | 0 |
| Waters/wetlands | Upstream Bridge Replacement | 0.002 | 0.71 |
| | Downstream Bridge Replacement | 0.002 | 0.71 |
| | Bridge Preservation with Upslope Retaining Wall | 0.002 | 0.002 |
| Ruderal/Disturbed | Upstream Bridge Replacement | 0.6 | 1.4 |
| | Downstream Bridge Replacement | 0.6 | 1.4 |
| | Bridge Preservation with Upslope Retaining Wall | 0.6 | 0.9 |
| Sparsely Vegetated Slope | Upstream Bridge Replacement | 0.5 | 0 |
| | Downstream Bridge Replacement | 0.5 | 0 |
| | Bridge Preservation with Upslope Retaining Wall | 0.3 | 0 |

Table 2.3.1-6. Area of Natural Communities Affected at Patrick Creek Narrows Location 3

| Community | Area Permanently Affected (acres) | Area Temporarily Affected (acres) |
|--------------------------|-----------------------------------|-----------------------------------|
| Douglas-Fir Forest | 0.10 | 0 |
| Red Alder Forest | 0.01 | 0 |
| Bigleaf Maple Forest | 0.01 | 0 |
| Waters/Wetlands | 0.004 | 0.002 |
| Ruderal/Disturbed | 0.1 | 0.05 |
| Sparsely Vegetated Slope | 0.03 | 0 |

Table 2.3.1-7. Area of Natural Communities Affected at the Narrows

| Community | Area Permanently Affected (acres) | Area Temporarily Affected (acres) |
|--------------------------|-----------------------------------|-----------------------------------|
| Waters/Wetlands | 0.002 | 0.004 |
| Ruderal/Disturbed | 0.2 | 0.15 |
| Sparsely Vegetated Slope | 0.05 | 0 |

Table 2.3.1-8. Area of Natural Communities Affected at the Washington Curve Site

| Community | Alternative | Area Permanently Affected (acres) | Area Temporarily Affected (acres) |
|---|----------------|-----------------------------------|-----------------------------------|
| Douglas-Fir Forest | Cut Slope | 0.2 | 0 |
| | Retaining Wall | 0.1 | 0 |
| Knobcone Pine Forest | Cut Slope | 0.5 | 0 |
| | Retaining Wall | 0.2 | 0 |
| Emergent Wetlands, including Roadside Seeps and Drainages | Cut Slope | 0.003 | 0.003 |
| | Retaining Wall | 0.003 | 0.003 |
| Ruderal/Disturbed | Cut Slope | 0.1 | 0.1 |
| | Retaining Wall | 0.1 | 0.1 |
| Sparsely Vegetated Slope | Cut Slope | 0.1 | 0 |
| | Retaining Wall | 0.1 | 0 |

Effects on Trees

The Forester/Arborist Report (2012) concluded that the project would have minimal effects on trees. The report cited the resilience of redwoods in general, noting that the trees adjacent to the current roadway were healthy and had survived the earlier forest removal, residential development and highway construction at the sites. Most healthy trees can withstand impacts 30% of their root zone. Redwoods in particular are resistant to root impacts. While some trees would be removed with implementation of the proposed project, the remaining trees would not have significant effects. Ecological effects due to the removal of trees were considered above. The narrow slivers of habitat being lost along the roadway to not constitute significant effects on natural communities. The presence of the roadway and other developments (residential and quarry) fragments the habitat and detracts from the ecological value of the landscape.

Ruby 1 Site

The work proposed at the Ruby 1 site would involve the removal of two redwood trees with diameters-at-breast-height of 17 and 18 inches, three alder trees with dbh of 14 inches (two trees) and 16 inches, and a cluster of California bay trunks with dbh of approximately 42 inches. These tree removals would not be a significant impact, because no large old redwood trees would be removed.

Potential effects to trees outside the project footprint were assessed. There were 19 trees and clumps of trees greater than 36 inches dbh within the PEZ. Of these 10 trees/clumps had no potential effects in the 5 times dbh root zone, 7 had potential effects of 1-10% of this root zone, and 2 had potential effects to 10-20% of the root zone. There would be no significant root effects to these trees from this project. None of the other effects quantified in the analysis (such as increased wind or light) had any significant effects on these large trees.

Ruby 2 Site

Each of the three alternatives proposed for the Ruby 2 site would involve the removal of several mature trees and some large stumps. These impacts are summarized below. Specific tree species and dbh measurements are listed in Table 2.3.1-9.

Four-Foot Shoulders Alternative

Ten redwood trees with a dbh of 36 inches or more would be removed (144 inches, 126 inches, 120 inches, and 94 inches). The removal of ten large, old redwood trees would be a significant impact.

The Forester/Arborist Report specifically evaluated and analyzed potential effects on trees from the Two-Foot Widening in Spot Locations Alternative, including tree removal, potential effects on tree roots, and potential wind effects, concluding that the potential effects under that alternative would be none, minimal or slight. Based on that analysis, the Four-foot Shoulders Alternative would likely result in similar impacts. While it is likely that there would be only minimal impacts to the remaining trees, because that analysis was conducted on a tree by tree basis, there is the potential for this alternative to have moderate to severe impacts to remaining individual trees. Thus overall, the effect of this alternative would be the removal of ten redwoods >36 inches dbh and the potential for significant effects to other individual trees adjacent to the project footprint.

Two-Foot Shoulders Alternative

Four redwood trees with a dbh of 36 inches or more would be removed, the largest with a dbh of 48 inches. The removal of four large, old redwood trees would be a significant impact.

The Forester/Arborist Report specifically evaluated and analyzed potential effects on trees from the Two-Foot Widening in Spot Locations Alternative, including tree removal, potential effects on tree roots, and potential wind effects, concluding that the potential effects under this alternative would be none, minimal or slight. Based on the analysis and methodology employed in the Forester/Arborist Report for potential effects on tree roots, which would apply similarly under the other alternatives at the Ruby 2 site, the Four-foot Shoulders Alternative would result in similar impacts. Because the analysis was conducted on a tree by tree basis, there is the potential for this alternative to have significant impacts to remaining individual trees. Thus overall, the effect of this alternative would be the removal of four redwoods >36 inches dbh and the potential for significant effects to other individual trees adjacent to the project footprint.

Two-Foot Widening in Spot Locations Alternative

No redwood trees with a dbh of 36 inches or more would be removed. The largest redwoods that would be removed for the Two-Foot Widening in Spot Locations Alternative have diameters at breast height of 27 inches, 23 inches, and 18 inches. This tree removal would not be a significant impact, because no large old redwoods would be removed.

The Forester/Arborist Report analyzed potential effects to trees outside the project footprint. There were 38 trees and clumps of trees (2 bay laurels and 35 redwoods) greater than 36 inches dbh within the PEZ. Of these 19 trees/clumps had no potential effects in the 5 times dbh root zone, 9 had potential effects of 1-10% of this root zone, and 9 had potential effects to 10-20% of the root zone. None of the other indirect effects quantified in the analysis (such as increased wind or light) had any significant effects on large trees.

The Two-Foot Widening in Spot Locations Alternative would have the least impact on trees. It would involve the removal of no large old redwood trees greater than 36 inches dbh, and have no significant impacts to remaining trees larger than 36 inches dbh.

**Table 2.3.1-9. Tree Removal Impacts at the Ruby 2 Site by Alternative
(bullets indicate trees that will be removed)**

| | | Dbh (inches) | Four-Foot Shoulders Alternative | Two-Foot Shoulders Alternative | Two-Foot Widening in Spot Locations Alternative |
|-----|----------------|-----------------|---------------------------------------|--------------------------------------|--|
| 1 | Stump | 72 | ○ | ○ | ○ |
| 2 | Redwood | 23 | • | • | • |
| 3 | California bay | 16 | | | • |
| 4 | Redwood | 126 | • | | |
| 5 | Bigleaf maple | 12 | • | | • |
| 6 | Bigleaf maple | 12 | • | | • |
| 7 | California bay | 16 | • | | |
| 8 | Redwood | 60 | • | | |
| 9 | Redwood | 94 | • | | |
| 10 | Douglas-fir | 20 | • | | |
| 11 | Redwood | 144 | • | | |
| 12 | Stump | 180 | ○ | | |
| 13 | Redwood | 14 | • | | |
| 14 | Stump | 120 | ○ | ○ | |
| 15 | Red alder | 17 | | | • |
| 16 | Red alder | 14 | | | • |
| 17 | Red alder | 10 | | | • |
| 18 | Red alder | 10 | | | • |
| 19 | Red alder | 10 | | | • |
| 20 | Red alder | 10 | | | • |
| 21 | Red alder | 10 | | | • |
| 22 | Red alder | 10 | | | • |
| 23 | Stump | 120 | | | ○ |
| 24 | Redwood | 120 | • | | |
| 25* | Red alder | 6–12 | | | • |
| 26 | Redwood | 23 | • | • | |
| 27 | Redwood | 24 | • | • | |
| 28* | Redwood | 6–12 | • | • | |
| 29 | Stump | 144 | ○ | | |
| 30 | Redwood | 36 | • | • | |
| 31 | California bay | 24 | • | • | |
| 32* | Redwood | 6–12 | • | • | |
| 33 | Stump | 72 | ○ | ○ | |
| 34 | Redwood | 12 | • | • | |
| 35 | Redwood | 12 | • | • | |
| 36 | Redwood | 48 | • | • | |
| 37 | Redwood | 36 | • | • | |
| 38 | Stump | 120 | ○ | ○ | |
| 39 | Stump | 54 | ○ | ○ | |
| 40 | Redwood | 19 | • | • | |
| 41 | Stump | 96 | ○ | ○ | |
| 42 | Redwood | 120 | • | • | |

| | | Dbh (inches) | Four-Foot Shoulders Alternative | Two-Foot Shoulders Alternative | Two-Foot Widening in Spot Locations Alternative |
|---------------------|----------------|-----------------|---------------------------------------|--------------------------------------|--|
| 43* | Bigleaf maple | 6-12 | • | • | |
| 44* | Bigleaf maple | 6-12 | • | • | |
| 45 | Redwood | 12 | • | • | |
| 46 | Redwood | 36 | • | • | |
| 47 | Redwood | 12 | • | • | |
| 48 | Redwood | 31 | • | • | • |
| 49 | California bay | 12 | • | • | |
| 50* | California bay | 6-12 | • | • | |
| 51* | Redwood | 6-12 | • | • | |
| 52 | Redwood | 48 | • | | |
| 53 | Tanoak | 48 | • | | |
| 54 | Red alder | 12 | • | | |
| 55 | Redwood | 60 | • | | |
| 56 | Stump | 60 | ○ | | |
| 57 | Redwood | 18 | • | • | • |
| 58 | Stump | 48 | ○ | | |
| 59 | Stump | 72 | ○ | ○ | ○ |
| 60* | Red alder | 6-12 | • | | |
| 61 | Redwood | 16 | • | | |
| 62 | Stump | 72 | ○ | ○ | ○ |
| 63* | Red alder | 6-12 | • | | |
| 64* | Redwood | 6-12 | • | | |
| 65* | Red alder | 6-12 | • | | |
| 66* | Red alder | 6-12 | • | | |
| 67* | Red alder | 6-12 | • | | |
| 68* | Red alder | 6-12 | • | | |
| 69* | Red alder | 6-12 | • | | |
| 70* | Red alder | 6-12 | • | | |
| 71* | Red alder | 6-12 | • | | |
| 72* | Red alder | 6-12 | • | | |
| 73* | Incense cedar | 6-12 | • | | |
| Trees/Alt.: | | | 50 | 23 | 15 |
| Stumps/Alt.: | | | 12 | 8 | 4 |

* Indicates survey data from ICF; the rest are Department survey data.

○ Indicates a stump.

Patrick Creek Narrows Location 1

The work proposed at Patrick Creek Narrows Location 1 would involve removal of approximately 18 trees (Douglas-fir and white alder) between 5 and 9 inches dbh.

Patrick Creek Narrows Location 2

The work proposed at Patrick Creek Narrows Location 2 would involve the removal of a number of trees. Species that would be affected include bigleaf maple (*Acer macrophyllum*), California

bay (*Umbellularia californica*), Canyon live oak (*Quercus chrysolepis*), white alder (*Alnus rhombifolia*), coast redwood (*Sequoia sempervirens*), tanoak (*Lithocarpus densiflora*), Douglas-fir (*Pseudotsuga menziesii* sp. *menziesii*), and Pacific madrone (*Arbutus menziesii*). These impacts are summarized in Tables 2.3.1-10 and 2.3.1-11.

There is a stand of old growth Douglas-fir east of Patrick Creek Narrows Location 2. Some of these Douglas-fir were considered large old trees due to their size (>36 in dbh), however removal of individual large old Douglas-fir trees was not considered a significant impact because of extensive range of Douglas-fir (extending north through Washington and Oregon into British Columbia), and more remaining reserves of old growth Douglas-fir than redwood.

The Forester/Arborist Report analyzed the Downstream Bridge Replacement Alternative. The result showed some potential root effects to individual trees adjacent to the proposed project footprint. Extrapolating these results to the other two alternatives, there may be effects to a few other trees adjacent to the proposed project footprint. The loss of these individual trees is not considered a significant effect in this analysis. The sum of the loss of these trees would be considered loss of forest habitat, and significance would be determined by the rarity of the habitat and its use by species of special concern (plant and animal). The small amount of habitat affected by the proposed project, compared to the habitat available within the watershed make any habitat level effects insignificant.

The 137 trees shown in Table 2.3.1-10 are located on the steep slope on the left side of the highway, south of the bridge (See Appendix K). These 137 trees would be removed under all three alternatives.

Work proposed under the Downstream Bridge Replacement Alternative would involve the removal of 29 additional trees (for a total of 154 trees). There are five large old Douglas-fir trees greater than 36 inches dbh at and near the proposed project site. One of the trees with a dbh of 52 inches would be removed. One tree, 40 inches dbh, would have moderate root effects (20-30% of root zone disturbed); one tree, 53 inches dbh would have slight root effects (10-20% of root zone disturbed); and two trees, 37 and 51 inches dbh, would have no root effects. Due to the nature of the work and the slopes involved, the 40 in dbh tree with moderate root effects may need to be removed.

Work proposed under the Upstream Bridge Replacement Alternative would entail the removal of 16 additional trees (for a total of 141 trees). Two large Douglas-firs would be removed, one with a dbh of 42 inches and another with a dbh of 48 inches. None of the 12 remaining trees to be removed under the Upstream Bridge Replacement Alternative has a dbh of more than 24 inches. Root effects may occur to trees adjacent to construction activities that could result in a few additional tree losses.

The Bridge Preservation with Upslope Retaining Wall Alternative would call for the removal of 23 additional trees (for a total of 148 trees). Two large Douglas-firs would be removed, one with a dbh of 42 inches and another with a dbh of 48 inches. A Douglas-fir with a dbh of 26 inches and a bigleaf maple with a dbh of 23 inches would also be removed under the Bridge Preservation with Upslope Retaining Wall Alternative. Root effects may occur to trees adjacent to construction activities that could result in a few additional tree losses.

Table 2.3.1-10. Tree Removal Impacts at Patrick Creek Narrows Location 2 by Alternative South and West of the Bridge (dbh in inches)

| Quantity | Species | Dbh (inches) | Downstream Bridge Replacement | Upstream Bridge Replacement | Preservation with Upslope Retaining Wall |
|----------|-----------------|--------------|-------------------------------|-----------------------------|--|
| 2 | Canyon live oak | 12 | • | • | • |
| 1 | California bay | 5 | • | • | • |
| 4 | Bigleaf maple | 6-8 | • | • | • |
| 1 | Douglas-fir | 6 | • | • | • |
| 26 | Canyon live oak | 6-12 | • | • | • |
| 1 | Canyon live oak | 14 | • | • | • |
| 6 | Pacific madrone | 6-10 | • | • | • |
| 10 | Canyon live oak | 8 | • | • | • |
| 1 | Douglas-fir | 16 | | • | • |
| 2 | Douglas-fir | 8-10 | • | • | • |
| 1 | Douglas-fir | 14 | | • | • |
| 2 | Douglas-fir | 6-12 | | • | • |
| 1 | Canyon live oak | 10 | • | • | • |
| 12 | Canyon live oak | 6-8 | • | • | • |
| 1 | Canyon live oak | 12 | | • | • |
| 2 | Douglas-fir | 12 | | • | • |
| 1 | Douglas-fir | 14 | | • | • |
| 38 | Douglas-fir | 6-12 | | • | • |
| 4 | White alder | 8 | | • | • |
| 8 | Canyon live oak | 6-12 | | • | • |
| 2 | Douglas-fir | 24 | | • | • |
| 1 | Douglas-fir | 34 | | • | • |
| 2 | Douglas-fir | 36 | | • | • |
| 1 | Douglas-fir | 32 | | • | • |
| 3 | Douglas-fir | 16 | | • | • |
| 3 | Douglas-fir | 28 | | • | • |
| 1 | Douglas-fir | 17 | | • | • |
| 1 | Canyon live oak | 12 | | • | • |
| 8 | Canyon live oak | 6-8 | | • | • |
| 1 | Canyon live oak | 12 | • | • | • |
| 2 | Douglas-fir | 12 | | • | • |
| 2 | Douglas-fir | 24-26 | • | • | • |
| 1 | Douglas-fir | 18 | | • | • |
| 1 | Douglas-fir | 15 | • | • | • |
| 1 | Canyon live oak | 10 | • | • | • |
| 2 | Tanoak | 10 | • | • | • |
| 1 | Douglas-fir | 17 | • | • | • |
| 1 | Tanoak | 6 | • | • | • |
| 2 | White alder | 6-12 | | • | • |
| 1 | Bigleaf maple | 10 | • | | |
| 4 | Tanoak | 8-10 | • | | |
| 1 | Douglas-fir | 34 | • | | |
| 1 | Douglas-fir | 24 | • | | |
| 2 | Pacific madrone | 12 | • | | |

| Quantity | Species | Dbh (inches) | Downstream Bridge Replacement | Upstream Bridge Replacement | Preservation with Upslope Retaining Wall |
|---|-------------|--------------|-------------------------------|-----------------------------|--|
| 1 | Douglas-fir | 21 | • | | |
| 1 | Douglas-fir | 36 | | | |
| Tree Removal South of Bridge/Alt | | | 84 | 160 | 160 |

Table 2.3.1-11. Tree Removal Impacts at Patrick Creek Narrows Location 2 by Alternative North and East of the Bridge (dbh in inches)

| Quan | Species | Dbh inches | Downstream Bridge Replacement | Upstream Bridge Replacement | Preservation with Upslope Retaining Wall |
|---|------------------|------------|-------------------------------|-----------------------------|--|
| 2 | White alder | 14 | | • | |
| 1 | Douglas-fir | 8 | | • | |
| 1 | Bigleaf maple | 14 | | • | |
| 1 | Bigleaf maple | 6 | | • | |
| 1 | Douglas-fir | 42 | | • | |
| 1 | Canyon live oak | 12 | | • | |
| 1 | Douglas-fir | 14 | | • | |
| 1 | White alder | 6 | | • | |
| 2 | Canyon live oak | 11 | | • | |
| 2 | Douglas-fir | 38 | | • | |
| 1 | Big leaf maple | 14 | • | | |
| 1 | Tanoak | 8 | • | | |
| 2 | Canyon live oak | 9 | • | | |
| 1 | Canyon live oak | 13 | • | | |
| 2 | Big leaf maple | 10+8* | • | | |
| 1 | Tanoak | 18 | • | | • |
| 1 | Douglas-fir | 6 | • | | |
| 1 | Mountain dogwood | 9 | | | • |
| 1 | California bay | 10 | • | | • |
| 2 | Bigleaf maple | 15+20* | • | | • |
| 1 | Douglas-fir | 52 | • | | |
| 2 | Tanoak | 10+6* | • | | |
| 1 | Tanoak | 8 | • | | |
| 1 | Tanoak | 8 | • | | |
| 3 | Tanoak | 6 | • | | |
| 2 | Tanoak | 15 | • | | |
| 2 | Tanoak | 13+12* | • | | |
| Tree Removal North of Bridge/Alt | | | 24 | 13 | 5 |
| TOTAL TREE REMOVAL / ALT | | | 108 | 173 | 165 |

* Indicates trees with multiple trunks

Patrick Creek Narrows Location 3

The work proposed at Patrick Creek Narrows Location 3 would not involve tree removal. No effects on trees would occur.

The Narrows

The work proposed at the Narrows would remove up to approximately 46 trees (Douglas-fir, canyon live oak, and Pacific madrone) consisting of:

- 1 Douglas-fir, 24" dbh
- 5 Douglas-firs, 20" dbh
- 15 Douglas-firs, 6-12" dbh
- 15 Canyon live oaks, 6-12" dbh
- 10 Pacific madrones, 6-12" dbh

Washington Curve Site

Two alternatives are being considered for the work proposed at the Washington Curve site.

The Cut Slope Alternative would include the removal of approximately 138 tree stems (or 55 clumps of trees) consisting of:

- 4 knobcone pine, 13-16 " dbh
- 28 knobcone pine, 6-12 " dbh
- 2 Douglas-fir, 26-28" dbh
- 10 Douglas-fir, 12-22" dbh
- 14 Douglas-fir, 5-11" dbh
- 22 Canyon live oak 5-15" dbh
- 56 tanoak, 5-10" dbh
- 2 Pacific madrone, 7" dbh

Thirty nine trees near the top of the cut will have potential root effects, and some near the edge of the cut will also need to be removed.

The Retaining Wall Alternative would include the removal of approximately 15 trees consisting of:

- 2 knobcone pine, 6-12" dbh
- 8 Douglas-fir, 6-12" dbh
- 4 tanoak, 6-12" dbh
- 1 canyon live oak, 6-12" dbh

The Retaining Wall Alternative would have the least impact because it would involve less ground disturbance and fewer trees; however, neither alternative would have adverse effects.

The tree removal for the project sites along 199 (Patrick Creek Locations, Narrows and Washington Curve) would not significantly affect forest resources and habitat. These trees represent forest habitat types that are well represented within the watershed. The proposed alternatives represent small slivers of habitat along the current roadway. None of the tree

removals from the Patrick Creek Narrows Location 1, 2 and 3, The Narrows, and Washington Curve discussed above rise to the level of a significant adverse affect.

Effects on Wildlife Corridors for Marbled Murrelet

Construction activities, including blasting at the Narrows site, could disturb the migration of breeding marbled murrelet. This species uses the Middle Fork Smith River canyon as a migration corridor during breeding. Disruption of this migration is considered adverse. This species is discussed further in Section 2.3.5, “Threatened and Endangered Species.” Effects on marbled murrelet as a result of this project are expected to be negligible. With the implementation of avoidance and minimization measures (section 2.3.5.4) the action may affect, but is not likely to adversely affect marbled murrelet.

Effects on Fish Passage

Work within the Middle Fork Smith River could restrict the passage of fish species, including anadromous fish. At Patrick Creek Narrows Location 2, no stream diversions are proposed during construction of the Upstream Bridge Replacement Alternative or the Downstream Bridge Replacement Alternative, so no impacts are anticipated for fish passage in the river. Effects on fish are discussed further in Section 2.3.4, “Animal Species,” and 2.3.5, “Threatened and Endangered Species.”

Effects on Habitat Connectivity (Fragmentation)

The highways in the area act as barrier to terrestrial wildlife and fragment their habitat. The modifications proposed by this project would neither improve nor substantially exacerbate habitat fragmentation. The proposed project would result in minor roadway widening and some vegetation removal. However, the project is not anticipated to result in increased traffic levels. In addition, it would not result in a substantial increase in habitat fragmentation. Effects on habitat connectivity as a result of this project are expected to be negligible.

Re-establishment of Native Species Composition in Existing Natural Communities

Ground disturbance resulting from proposed project activities would expose bare soil. In the absence of erosion control seeding and/or plant installation after construction is complete, non-native and invasive plant species may colonize and eventually dominate areas of ground disturbance. Permanent enhanced erosion control seeding and revegetation will be used to re-establish native species composition of existing natural communities in which ground disturbance is proposed. This would minimize open ground available for establishment of invasive plant species, in compliance with Presidential Executive Order 13112 on Invasive Species (February 3, 1999), and it would help maintain natural ecological processes and minimize habitat fragmentation and loss. It would also help re-establish natural communities in areas that are difficult to plant and maintain due to extreme conditions (e.g., dry soils, sometimes steep soil and rock slopes, nutrient-poor soils), while also meeting the goals of minimizing soil erosion and discharge of sediments to receiving waters. Permanent enhanced erosion control seeding is planned at all locations of disturbed soil, and refers to using a more diverse species selection in the seed mix, including a variety of regionally appropriate native trees, shrubs, and herbs. Revegetation refers to the planting of containerized native trees, shrubs, and/or herbs in disturbed soil areas. This is proposed in front of private parcels at Ruby 2 as a visual screen, with permission from property owners. Revegetation would also likely occur at Patrick Creek

Narrows Location 2. Adverse effects to native species composition in existing natural communities as a result of this project are expected to be minor and temporary.

Effects on Water Quality (Turbidity)

Bridge work and culvert replacement may result in temporary sediment discharge into receiving waters. This discharge would be temporary and minimal. Adverse effects to water quality as a result of this project are expected to be negligible. To reduce long-term erosion and sediment discharge into receiving waters, RSP would be placed at up to 13 culvert outlets. Typically, a 6-foot by 14-foot area of RSP is placed in the drainage channel. The RSP consists of 1/4-ton crushed rock (approximately 1.8 feet in diameter).

No Build (No Action) Alternative

Under the No Build (No Action) Alternative, there would be no construction and therefore no effects on habitat connectivity (fragmentation), natural communities, wildlife corridors, or fish passage.

2.3.1.3 Avoidance, Minimization, and/or Mitigation Measures

Enhanced Erosion Control Seeding and Revegetation

Enhanced Erosion Control: Enhanced erosion control seeding would be implemented at all project locations after construction is complete. For the purposes of this project, enhanced erosion control seeding refers to using a more diverse species selection in the seed mix, including a variety of regionally appropriate native trees, shrubs, and herbs. This permanent erosion control will be applied to all disturbed soils consistent with the North Coast Regional Water Quality Control Board 401 Certification for the project and the Department's current *Storm Water Quality Handbook Construction Site Best Management Practices Manual*. Seed mixes would be customized to address habitat variation at the different project sites and to be ecologically suitable for the site conditions after soil disturbance from construction activities. The potential seeding species to be collected are the native species listed by occurrence at each location in Appendix N, overseen by a botanist, plant ecologist, or qualified staff with knowledge of flora of the SR 197 and US 199 region. In case seed collection does not provide enough seed for each location, an adequate quantity of a regional native grass species (northwest California), such as wildrye (*Elymus glaucus*) or Idaho fescue (*Festuca idahoensis*) will supplement collected seed and ensure short-term soil stabilization during establishment of long-term native revegetation.

Revegetation: Revegetation, for the purposes of this project, refers to the planting of containerized native trees, shrubs, and/or herbs in disturbed soil areas. This is proposed at Ruby 2 in front of private parcels as a visual screen, with permission from property owners, and it would also likely occur at Patrick Creek Narrows Location 2. The revegetation species list would include regionally appropriate (Del Norte County) trees, shrubs, and herbs that are suited to the habitats of the project area. Planting would reflect natural vegetation patterns, groupings, strata, and species diversity. The species selection and quantity would be determined based on habitat, disturbance tolerance, and desired spacing, without over-planting, and as evaluated by a qualified botanist, plant ecologist, or similarly qualified staff. The potential container plants that would be used are the native plants listed by occurrence at each location, in Appendix N.

Invasives: No invasive plant species would be used at any location. During the revegetation monitoring period, invasive species such as Himalayan blackberry (*Rubus armeniacus*, formerly *R. discolor*) and French broom (*Genista monspessulana*) will be eliminated or controlled per the Invasive Plants Avoidance, Minimization, and Mitigation Measures section (see Section 2.3.6.4).

Site Preparation: On-site topsoil and/or duff (i.e., leaf litter and small branches) will be collected prior to construction whenever feasible, stockpiled, then reapplied in disturbed soils in project areas, such as along the old highway alignment that would be decommissioned if a bridge replacement alternative is selected at Patrick Creek Narrows Location 2. Off-highway staging and old highway alignment areas, where seeding or revegetation is anticipated, will require approximately 18 to 24 inches of ripping, where feasible, to decompact soils and facilitate revegetation prior to topsoil/duff application and seeding/revegetation.

Monitoring of Enhanced Erosion Control: Enhanced erosion control seeding would be monitored for 2 years, starting approximately 1 year after hydroseeding and preferably during the blooming season. There would be three monitoring success criteria: a minimum of approximately 20% absolute cover⁴ along road shoulders, a minimum of approximately 1 to 5% absolute cover on steep slopes (except rock faces), and presence of at least 30% native species. These success criteria are based on visual estimates of absolute cover in exposed areas at Patrick Creek Narrows Location 2, where vegetative cover are relatively low (i.e., approximately 30% absolute cover in exposed road shoulders and up to approximately 5% on shady and exposed steep slopes). If the success criteria are not met, a review will be conducted by a qualified botanist, plant ecologist, or similarly qualified staff to determine potential reason(s) for failure to meet the success criteria and to develop and implement remedial measures as needed; remedial measures may not be needed if native recruitment provides adequate ground coverage, compared to vegetative cover prior to project construction. Potential remedial measures may include additional native seed collection and re-seeding the project location.

Revegetation Monitoring: Revegetated areas (i.e., Ruby 2 and likely Patrick Creek Narrows Location 2) will be annually census monitored. Survival will be assessed approximately one year after planting and for two subsequent years to assess the survival of installed plants (three years total). The monitoring success criterion will be that greater than 70% of plants installed at the end of the monitoring period will have survived; or, at the end of the monitoring period, installed plants and plants arising from native recruitment in the vicinity of the planted area will be greater than 70% of the plants installed. If these criteria are not met, a review will be conducted by a qualified botanist, plant ecologist, or similarly qualified staff to determine potential reason(s) for failure to meet the success criteria and to develop and implement remedial measures as needed. Potential remedial measures may include re-planting, if native plant recruitment has not adequately ameliorated poor planting success.

Further details regarding enhanced erosion control seeding and revegetation are listed in Appendix R, Enhanced Erosion Control Seeding and Revegetation Plan.

⁴ “Absolute cover refers to the actual percentage of the ground (surface of the plot or stand) that is covered by a species or group of species. Absolute cover of all species or groups if added in a stand or plot may total greater or less than 100 percent because it is not a proportional number.” (Evens, J.M, S. San, J. Taylor, and J. Menke. 2004. Vegetation classification and mapping of Peoria Wildlife Area, south of New Melones Lake, Tuolumne County, California. Accessed via http://www.cnps.org/cnps/vegetation/pdf/1_CNPS_TableMtn_Final_Report.pdf on 8/4/12.)

Delineate Environmentally Sensitive Areas with Exclusionary Fencing

The Department will establish, as indicated on project plans, specifications to avoid potential construction impacts on sensitive biological resources (i.e., sensitive natural communities and plant and lichen locations) adjacent to the construction sites and staging areas. Temporary exclusionary fencing will be placed around areas of sensitive natural communities and special-status and sensitive plant and lichen species that are adjacent to proposed staging/storage and construction areas, thereby prohibiting construction activities in those areas.

Control Plant Pathogens

To avoid the spread of plant diseases such as sudden oak death and Port Orford cedar (POC) root disease, best management practices will be implemented. These include the following:

- washing heavy equipment before and after ground-disturbing activities,
- removing POC from road areas to reduce the risk of infection (sanitation logging),
- directing water runoff away from POC areas, and
- using pathogen-free water for dust control, such as from a commercial or municipal water source.

Protect Roots of Large Old Redwood Trees

At both project locations on SR 197, many large old redwood trees (with a dbh of more than 36 inches) are within the project area. To minimize potential impacts on these trees, only hand tools or a pneumatic excavation tool (such as an Air Spade) will be used for excavation within the Structural Root Zone of large old redwood trees. The Structural Root Zone of a tree is a circular area (the tree trunk is at the center of the circle) with a radius three times the dbh of the trunk. Only an air spade or handwork will be used for excavation within the Structural Root Zone of redwood trees that are 36 inches dbh or greater. The pneumatic excavation tool turns compressed air into a high speed air jet, which dislodges soil particles but does not harm solid material, such as tree roots. This is a tool commonly used by arborists when it is necessary to excavate within the root zone of a tree. Within the Structural Root Zone, any root encountered that needs to be removed will be cut cleanly to optimize healing potential.

The following avoidance and minimization measures will be implemented for work near large old trees:

- An arborist shall be present to monitor any ground disturbing construction activities.
- All excavation below the finish grade within a setback equal to three times the diameter of any large old trees shall be conducted with hand tools, Air-Spade or other methods approved by the construction engineer and arborist to minimize disturbance or damage to the roots with exception of culvert work. Mechanized equipment can be used at the culvert locations upon approval of the construction engineer.

- The contractor will be required to use a pneumatic excavator (such as an Air-Spade) while excavating the soil within the structural root zone of trees greater than 36 inches dbh to minimize physical injury to the tree roots.
- Smaller roots, less than 2 inches in diameter, that must be cut, shall be cut cleanly with sharp instruments in order to promote healing. Roots larger than 2 inches diameter will not be cut.
- After construction cut and fill slopes will be replanted.
- Prior to excavation or fill the upper four to six inches of duff and native soil will be set aside for placement on the finished slopes to provide the nutrients and seedbank for natural revegetation.
- To help minimize potential stress on the large trees during construction, watering will be provided. In areas where roadway excavation will take place below the finish grade within the structural root zone of tree 36 inches dbh or greater, watering equivalent to ½ inch depth to an area defined as from the edge of existing pavement to 25 feet beyond the edge of pavement shall be performed. Watering shall be performed not more than 24 hours after the roadway excavation work at a site and shall occur weekly thereafter between the dates of June 1st and September 30th.
- Any duff layer shall be raked off the area within the clearing limits, stored, and replaced as erosion control. For areas within the structural root zone of trees 36 inches dbh or greater, the duff will be hand raked.
- Where feasible and appropriate, structural fill will use one of the following methods to increase air and water porosity, minimize compaction of roots, decrease thickness of structural section, and/or minimize thermal exposure to roots from Hot Mix Asphalt paving:
 - a 0.75 foot thick layer of Class 1, Type A permeable material shall be placed and compacted as the first lift of the fill to increase water infiltration and air circulation, or
 - Cement Treated Permeable Base (CTPB) will be considered, or
 - Cornell Mix or CU-Structural Soil will be considered
- In locations where greater than 4 inches of fill would be placed next to the trunk of a tree greater than 36 inches dbh, a brow log shall be used to keep the soil from the tree trunk to increase air circulation.
- Equipment staging areas/storage areas shall be on the paved roadway or on existing unvegetated gravel/paved pullouts so there will be no staging in sensitive natural communities.
- The contract will state that no heavy equipment will be staged or parked within the drip line of large old trees, except in improved areas (paved or graveled).

Mitigation for Impacts on Large Old Redwood Trees

If one of the Ruby 2 alternatives that would remove large old redwood trees is selected, off-site or out-of-kind mitigation would be required. This would include measures that indirectly benefit large old redwoods and associated plant and animal species. Some options for off-site or out-of-kind mitigation include:

- Purchasing acreage of existing large old redwoods in nearby private ownership and transferring it to a non-profit conservation organization (such as Save-the-Redwoods League), or to a County, State, or National Park.
- Removal of invasive exotic plant species within the Department's right-of way in the Ruby 2 project vicinity to enhance habitat for native redwood forest species.
- Provide corvid-proof trash containers in nearby Ruby Van Deventer Park (corvids such as crows, ravens, and jays that eat the eggs of marbled murrelets).

2.3.2 Wetlands and Other Waters of the United States

This section contains no significant changes and is not being recirculated.

2.3.3 Plant Species

2.3.3.1 Regulatory Setting

USFWS and DFG share regulatory responsibility for the protection of special-status plant species. Special-status species are selected for protection because they are rare and/or subject to population and habitat declines. *Special status* is a general term for species that are afforded varying levels of regulatory protection. The highest level of protection is given to threatened and endangered species; these are species that are formally listed or proposed for listing as endangered or threatened under the federal Endangered Species Act (ESA) and/or the California Endangered Species Act (CESA). Please see Section 2.3.5, "Threatened and Endangered Species," section in this document for detailed information regarding these species.

This section of the document discusses all the other special-status plant species, including DFG fully protected species and species of special concern, USFWS candidate species, and California Rare Plant Rank rare and endangered plants, which are not state or federally listed. Special-status bryophytes, lichens, and fungi, as listed by the Forest Service for Six Rivers National Forest, are also discussed.

The regulatory requirements for ESA can be found at USC 16, Section 1531, et seq. See also 50 CFR Part 402. The regulatory requirements for CESA can be found at California Fish and Game Code, Section 2050, et seq. Department projects are also subject to the Native Plant Protection Act, found at California Fish and Game Code Sections 1900–1913 and CEQA, Public Resources Code Sections 2100–21177.

Special-status plants are species that are legally protected under the CESA, the ESA, or other regulations, as well as species considered sufficiently rare by the scientific community to qualify for such listing. For the purposes of this environmental document, special-status plants include the following:

- Species listed or proposed for listing as threatened or endangered under ESA (50 CFR 17.12 [listed plants] and various notices in the FR [proposed species]); species that are candidates for possible future listing as threatened or endangered under ESA (72 FR 69034, December 6, 2007; 73 FR 55175, December 10, 2008).
- Species listed or proposed for listing by the State of California as threatened or endangered under CESA (14 CCR 670.5).
- Species that meet the definitions of *rare* or *endangered* under CEQA (State CEQA Guidelines Section 15380).
- Plants listed as rare under the California Native Plant Protection Act (California Fish and Game Code Section 1900 *et seq.*).
- Plants considered by CNPS and DFG to be “rare, threatened, or endangered in California” (California Rare Plant Rank (formerly CNPS List) 1B and 2, California Native Plant Society 2007, 2008, 2009 and California Department of Fish and Game 2012) (State CEQA Guidelines Section 15381[d]).
- Plants on California Rare Plant Rank (formerly CNPS List) 3 and 4 (plants about which more information is needed to determine their status and plants of limited distribution, California Native Plant Society 2007, 2008, 2009 and California Department of Fish and Game) *may* be included as special-status species on the basis of local significance or recent biological information.
- Plants considered sensitive by Forest Service Region 5 that may occur in the Six Rivers National Forest (U.S. Forest Service 2006).

2.3.3.2 Affected Environment

This section is summarized from the NES (California Department of Transportation 2010). Supporting documentation for the NES is provided by the *Special-Status Plants Survey Report* (ICF International 2010) prepared for the project.

Qualified botanists conducted surveys and reviewed specific habitat requirements, life history notes, elevation, species distribution, and species lists to determine if any special-status plant, bryophyte, lichen, or fungi species were present in the project area. Existing records of special-status plant, bryophyte, lichen, and fungi species occurrences were consulted prior to conducting field surveys to assist in determining which species have the potential to occur in the project area. The following sources were consulted:

- USFWS species list for Del Norte County.
- CNDDDB (California Department of Fish and Game 2008, 2009) occurrence records from the project vicinity and surrounding USGS 7.5-minute quadrangles (Appendix N).

- Six Rivers National Forest Sensitive Plant and Fungi Species (U.S. Forest Service 2006).
- CNPS Electronic Inventory (California Native Plant Society 2008, 2009) occurrence records from the project vicinity and surrounding USGS 7.5-minute quadrangles (Appendix N).

Based on the above sources, it was determined that suitable habitat for a number of special-status plant species is present within the proposed area of direct impact. In addition, habitat for Six Rivers National Forest sensitive cryptogams (i.e., bryophytes, fungi, and lichen) was also identified within the proposed area of direct impact. Floristic surveys were conducted throughout the proposed area of direct impact during the blooming periods of all potentially occurring special-status plants (summarized in Table 2.3 of the NES). Tables 2.3.3-1 and 2.3.3-2 list the species identified with habitat in the proposed area of direct impact. A list of all plant species found during vascular plant surveys is included in Appendix N. For vascular plants and cryptogams, only species observed or those with moderate to high likelihood of occurrence in the project area are included in Tables 2.3.3-1 and 2.3.3-2. Vascular plants and cryptogams with low or no potential to occur in the project area are not included in the tables.

Table 2.3.3-1. Special-Status Vascular Plant Species Known or with Potential to Occur in the Proposed Area of Direct Impact, and California Rare Plant Rank 3 and 4 Species Known to Occur in the Proposed Area of Direct Impact

| Scientific Name | Common Name | Status | Habitat/Species Presence/Absence | Rationale |
|--|---|-----------------|----------------------------------|--|
| <i>Arabis macdonaldiana</i> | McDonald's rock cress | FE/SE/CRPR 1B.1 | Absent | Not found in area floristic surveys |
| <i>Arabis koehleri</i> var. <i>stipitata</i> | Koehler's stipitate rock cress | CRPR 1B.3/FSS | Absent | Not found in area floristic surveys |
| <i>Asarum marmoratum</i> | Marbled wild-ginger | CRPR 2.3 | Absent | Not found in area floristic surveys |
| <i>Boschniakia hookeri</i> | Small groundcone | CRPR 2.3 | Absent | Not found in area floristic surveys |
| <i>Cardamine nuttallii</i> var. <i>gemmata</i> | Yellow-tubered toothwort | CRPR 1B.3 | Present | Found during floristic surveys |
| <i>Carex leptalea</i> | Bristle-staked sedge (formerly flaccid sedge) | CRPR 2.2 | Absent | Not found in area floristic surveys |
| <i>Carex serpenticola</i> | Serpentine sedge | CRPR 2.3 | Absent | Not found in area floristic surveys |
| <i>Carex viridula</i> var. <i>viridula</i> | Green yellow sedge (formerly green sedge) | CRPR 2.3 | Absent | Not found in area floristic surveys |
| <i>Castilleja miniata</i> ssp. <i>elata</i> | Siskiyou Indian paintbrush | CRPR 2.2 | Absent | Not found in area floristic surveys |
| <i>Coptis laciniata</i> | Oregon goldthread | CRPR 2.2 | Absent | Not found in area floristic surveys |
| <i>Cypripedium californicum</i> | California lady's-slipper | CRPR 4.2 | Present | Found during floristic surveys |
| <i>Cypripedium fasciculatum</i> | Fascicled lady's-slipper | CRPR 4/ FSS | Absent | Not found in area floristic surveys |
| <i>Cypripedium montanum</i> | Mountain lady's-slipper | CRPR 4/FSS | Absent | Not found in area floristic surveys |
| <i>Darlingtonia californica</i> | California pitcherplant | CRPR 4.2 | Present | Found during floristic surveys |
| <i>Erigeron cervinus</i> | Siskiyou daisy | CRPR 4.3 | Present | Found during floristic surveys |
| <i>Eriogonum pendulum</i> | Waldo wild buckwheat | CRPR 2.2 | Absent | Not found in area floristic surveys |
| <i>Erythronium howellii</i> | Howell's fawn lily | CRPR 1B.3 | Absent | Not found in area floristic surveys |
| <i>Erythronium revolutum</i> | Coast fawn lily | CRPR 2.2 | Absent | Not found in area floristic surveys |
| <i>Gilia capitata</i> ssp. <i>pacifica</i> | Pacific gilia | CRPR 1B.2 | Absent | Not found in area floristic surveys |
| <i>Horkelia congesta</i> ssp. <i>nemorosa</i> | Josephine horkelia | CRPR 2.1 | Absent | Not found in area floristic surveys |
| <i>Iris bracteata</i> | Siskiyou iris | CRPR 3 | Present | Not found flowering in area floristic surveys prior to DED; Found flowering in May 2011 |
| <i>Lathyrus delnorticus</i> | Del Norte pea | CRPR 4.3 | Present | Found during floristic surveys |
| <i>Lewisia oppositifolia</i> | Opposite-leaved lewisia | CRPR 2.2/FSS | Absent | Not found in area floristic surveys |
| <i>Lomatium howellii</i> | Howell's lomatium | CRPR 2.3 | Present | Found during floristic surveys |
| <i>Lomatium martindalei</i> | Coast Range lomatium | CRPR 2.3 | Present | Found during floristic surveys |
| <i>Monotropa uniflora</i> | Ghost-pipe | CRPR 2.2 | Absent | Not found in area floristic surveys |
| <i>Packera bolanderi</i> var. <i>bolanderi</i> (formerly genus <i>Senecio</i>) | Seacoast ragwort | CRPR 2.2 | Absent | Not found in area floristic surveys |
| <i>Pedicularis howellii</i> | Howell's lousewort | CRPR 4/FSS | Absent | Not found in area floristic surveys |

| Scientific Name | Common Name | Status | Habitat/Species Presence/Absence | Rationale |
|--|----------------------------|---------------|----------------------------------|---------------------------------------|
| <i>Pinguicula macroceras</i> | Horned butterwort | CRPR 2.2 | Present | Found during floristic surveys |
| <i>Piperia candida</i> | White-flowered rein orchid | CRPR 1B.2 | Absent | Not found in area floristic surveys |
| <i>Poa piperi</i> | Piper's bluegrass | CRPR 4.3 | Present | Found during floristic surveys |
| <i>Pyrrocoma racemosa</i> var. <i>congesta</i> | Del Norte pyrrocoma | CRPR 2.3 | Absent | Not found in area floristic surveys |
| <i>Sagittaria sanfordii</i> | Sanford's arrowhead | CRPR 1B.2 | Absent | Not found in area floristic surveys |
| <i>Salix delnortensis</i> | Del Norte willow | CRPR 4.3 | Present | Found during floristic surveys |
| <i>Sanguisorba officinalis</i> | Great burnet | CRPR 2.2 | Absent | Not found in area floristic surveys |
| <i>Saxifraga howellii</i> | Howell's saxifrage | CRPR 4.3 | Present | Found during floristic surveys |
| <i>Silene serpicicola</i> | Serpentine catchfly | CRPR 1B.2/FSS | Absent | Not found in area floristic surveys |
| <i>Streptanthus howellii</i> | Howell's jewel-flower | CRPR 1B.2/FSS | Absent | Not found in area floristic surveys |
| <i>Thermopsis gracilis</i> var. <i>gracilis</i> | Slender false lupine | CRPR 4.3 | Present | Found during floristic surveys |
| <i>Viola primulifolia</i> ssp. <i>occidentalis</i> | Western bog violet | CRPR 1B.2 | Absent | Not found in area floristic surveys |

CE: CA Endangered **CT:** CA Threatened **FE:** Federal Endangered **FT:** Federal Threatened **FC:** Federal Candidate for Listing **CSC:** State Species of Concern **FSS:** Forest Service Sensitive Species (Six Rivers National Forest). **FSS&M:** Forest Service Survey & Manage Species **California Rare Plant Rank (CRPR):** CRPR 1A: Plants Presumed Extinct in California; CRPR 1B: Plants Rare, Threatened, or Endangered in California and Elsewhere; CRPR 2: Plants Rare, Threatened, or Endangered in California, but more common elsewhere; CRPR 3: Plants About Which We Need More Information - A Review List; CRPR 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).

Table 2.3.3-2. Bryophytes, Fungi, and Lichen Species with Potential to Occur in the Proposed Area of Direct Impact

| Scientific Name | Common Name (type) | Status | Habitat/Species Presence/Absence | Rationale |
|--------------------------------|------------------------------|----------------------------------|----------------------------------|---|
| <i>Boletus pulcherrimus</i> | (fungus) | FSS & Survey & Manage Category B | Absent | Not found in area cryptogamic surveys |
| <i>Buxbaumia viridis</i> | (bryophyte) | Survey & Manage Category E | Absent | Not found in area cryptogamic surveys |
| <i>Calicium adpersum</i> | (lichen) | FSS & Survey & Manage Category E | Absent | Not found in area cryptogamic surveys |
| <i>Cantharellus subalbidus</i> | Montane chanterelle (fungus) | Survey & Manage Category D | Present | Found during cryptogamic surveys |
| <i>Dendrocollybia racemosa</i> | (fungus) | FSS | Absent | Not found in area cryptogamic surveys |
| <i>Fissidens pauperculus</i> | Minute pocket-moss | CNPS 1B.2/FSS | Absent | Not found in area cryptogamic surveys |
| <i>Lobaria oregana</i> | Lettuce lichen | Survey & Manage | Present | Found during cryptogamic surveys |
| <i>Otidia smithii</i> | (fungus) | FSS & Survey & Manage Category B | Absent | Not found in area cryptogamic surveys |
| <i>Phaeocollybia olivacea</i> | (fungus) | FSS & Survey & Manage Category E | Absent | Not found in area cryptogamic surveys |
| <i>Ptilidium californicum</i> | (bryophyte) | Survey & Manage Category A | Absent | Not found in area cryptogamic surveys |
| <i>Schistostega pennata</i> | (bryophyte) | Survey & Manage Category A | Absent | Not found in area cryptogamic surveys |
| <i>Sowerbyella rhenana</i> | (fungus) | FSS & Survey & Manage Category B | Absent | Not found in area cryptogamic surveys |
| <i>Teloschistes flavicans</i> | (lichen) | Survey & Manage Category A | Absent | Not found in area cryptogamic surveys |
| <i>Tetraphis geniculata</i> | (bryophyte) | Survey & Manage Category A | Absent | Found during cryptogamic surveys |
| <i>Usnea longissima</i> | Long-beard lichen | FSS | Absent | Not found in area cryptogamic surveys |

CE: CA Endangered **CT:** CA Threatened **FE:** Federal Endangered **FT:** Federal Threatened **FC:** Federal Candidate for Listing **CSC:** State Species of Concern **FSS:** Forest Service Sensitive Species (Six Rivers National Forest). **Survey & Manage:** Forest Service Survey & Manage Species. **California Rare Plant Rank (CRPR) 1A:** Plants Presumed Extinct in California; CRPR 1B: Plants Rare, Threatened, or Endangered in California and Elsewhere; CRPR 2: Plants Rare, Threatened, or Endangered in California, but more common elsewhere; CRPR 3: Plants About Which We Need More Information - A Review List; CRPR 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).

Survey Results

Special-Status and California Rare Plant Rank (CRPR) 3 and 4 Plants

Several locations with special-status and CRPR 3 and 4 plant species were found in the proposed area of direct impact during the field surveys. No special-status or CRPR 3 or 4 plants were found at the Ruby 1 and Ruby 2 sites. Three special-status plant species, one CRPR 3 species, and nine CRPR 4 species (which do not meet the definition of special status but may be considered uncommon and sensitive) were found in the proposed area of direct impact along US 199. The plant species, their population sizes, and occurrence locations are listed by species in Table 2.3.3-3, and the species are summarized by project location below. Occurrences of special-status and CRPR 3 and 4 plants that were found at or near potential staging areas are listed in Table 2.3.3-3, but not described in the text below.

Plant species with a ranking of CRPR 3 are considered plants about which the DFG California Natural Diversity Database and Rare Plant Status Review groups (300+ botanical experts from government, academia, non-governmental organizations, and the private sector) need more information to assign them to one of the other rare plant ranks or to reject them as a special status species⁵. Species in this rare plant rank are typically taxonomically problematic. As with the other rare plant ranks and state and global rankings, a threat rank is assigned after the rank 3 as a decimal value (i.e., 3.1, 3.2, 3.3). The threat code definitions are included at the end of Table 2.3.3-1, above.

Although CRPR 4 plants do not meet the definition of “rare, threatened, or endangered,” they are considered “of limited distribution or infrequent throughout a broader area in California, and their vulnerability or susceptibility to threat appears low at this time⁵.” These species are uncommon enough that their status should be monitored regularly. Specific CRPR 4 species in a project area may be considered of local concern or rare or unique to a region and therefore qualify as special-status species under CEQA (CEQA Guidelines Sections 15380 and 15125[a]) if, for example, they are at the periphery of the species’ range, occur in an area where the taxon is particularly uncommon, or occur in unusual habitats or elevations. The CRPR 4 species at the project were evaluated under these criteria by reviewing distributional information available from herbarium records in the Consortium of California Herbaria online specimen database (Regents of the University of California 2009), Calflora (Calflora 2009), the PLANTS database (U.S. Department of Agriculture, Natural Resources Conservation Service 2009), and any recent biological information. A threat rank is also assigned after the rank 4 as a decimal value (i.e., 4.1, 4.2, 4.3).

As a generality, the CRPR 3 and 4 species that occur in the project share several characteristics: They are mostly associated with serpentine soils; geographically, many of them range from southern Oregon to northern California; and several of the species reach their southern or southwestern distributional limits close to the project area. While some of the species are more common in the northern portions of their ranges, others are state listed in Oregon. It is concluded

⁵ CDFG Special Vascular Plants, Bryophytes, and Lichens List, 2012, accessed on-line on 7/12/12 at <http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/SPPlants.pdf>.

Table 2.3.3-3. Special-Status and California Rare Plant Rank (CRPR) 3 and 4 Plant Species Observed during Botanical Surveys

| Species | CRPR Status ^a | State and Global Rank ^a | Project Site ^b | Location and Habitat (Label per species polygon ^c) |
|---|--------------------------|------------------------------------|--|--|
| CRPR 1B and CRPR 2 (Special-Status) | | | | |
| <i>Cardamine nuttalli</i> var. <i>gemmata</i> Yellow-tubered toothwort | 1B.3 | S2.2, G5T3 | Patrick Creek Narrows Location 1 | Southwest of road, at top of slope behind guard rail, in Douglas-fir forest; 20–30 scattered plants (PC1-CANUG-1 and -2 combined) |
| <i>Cardamine nuttalli</i> var. <i>gemmata</i> Yellow-tubered toothwort | 1B.3 | S2.2, G5T3 | Patrick Creek Narrows Location 2 | Southeast of road, at curve south of bridge on gentle slope of ridge, in Douglas-fir forest; approximately 5 plants found during spring 2008 surveys; an additional approximately 70 plants were found in May 2011 site review (PC2-CANUG-1) |
| | | | | West of road and south of bridge, on lower part of very steep (60°) slope, very rocky, partly shaded; 30–40 plants (PC2-CANUG-2) |
| | | | | West of road and south of bridge, on lower part of very steep (60°) slope, very rocky, open; ~5 plants (PC2-CANUG-3) |
| | | | | Large area east of road and north of bridge, on flat area and on lower rock-covered slope, partly shaded, in old Douglas-fir forest; approximately 1,000–2,000 plants (PC2-CANUG-4) |
| | | | | West of road and north of bridge, and north of dirt river access road, flat to steep slope (45°), shaded, in Douglas-fir forest; ~50 plants (PC2-CANUG-6) |
| | | | | West of road and north of bridge in areas between road and river, flat to gently sloping, partly shaded, rocky, in open Douglas-fir forest; ~30 scattered plants (PC2-CANUG-5) |
| <i>Cardamine nuttalli</i> var. <i>gemmata</i> Yellow-tubered toothwort | 1B.3 | S2.2, G5T3 | Patrick Creek Narrows Location 3, Potential Staging Area PM 25.44 | On edge of road shoulder on gentle slope (10°), shaded; 121 plants (PC3-CANUG-1) |
| | | | Patrick Creek Narrows Location 3, Northeast of Potential Staging Area PM 25.55 | Northeast of unofficial pullout and private driveway on very steep (55°) slope, rocky, in big-leaf maple–dominated forest; 6 plants (PC3-CANUG-2) |
| | | | Patrick Creek Narrows Location 3, Potential Staging Area PM 25.69 | Edge of pullout at southwest side, on gravelly gentle slope, partly shaded; 50 plants (PC3-CANUG-3) |
| | | | Patrick Creek Narrows Location 3, Potential Staging Area PM 25.00 | Edge of open area on rocky, mossy bank, moderate slope (20°); 7 plants (PC3-CANUG-4) |
| | | | Patrick Creek Narrows Location 3, Potential Staging Area PM 26.15 | Edge of pullout, gentle slopes, gravelly soils; 7 scattered plants (PC3-CANUG-5 and -6 combined) |
| | | | Patrick Creek Narrows Location 3, Potential Staging Area PM 25.55 | South of private driveway, in vegetated area beyond the road shoulder (a potential staging area), approximately 30 plants (PC3-CANUG-7) |
| <i>Pinguicula macroceras</i> Horned butterwort | 2.2 | S3.2, G5 | Patrick Creek Narrows Location 1 | One small patch at west end of project site on north side of road, at edge of serpentine-influenced stream that parallels road shoulder; 20 plants (ramets) (PC1-PIMA-1) |

| Species | CRPR Status ^a | State and Global Rank ^a | Project Site ^b | Location and Habitat (Label per species polygon ^c) |
|---|--------------------------|------------------------------------|---|--|
| | | | Patrick Creek Narrows Location 1, Staging Area PM 19.80 | On nearly vertical slope at back of large pullout, on edge of small waterfall; 5–10 plants (ramets) (PC1-PIMA-2) |
| <i>Lomatium martindalei</i> Coast Range lomatium | 2.3 | S2.3, G5 | Patrick Creek Narrows Location 2 | In Douglas-fir forest in small patch at the north end of the project site north of the bridge on west side of road south of dirt access road to river; 25 plants (PC2-LOMA-1) |
| CRPR 3 | | | | |
| <i>Iris bracteata</i> Siskiyou iris | 3.3 | S3.3?, G4G5 | Patrick Creek Narrows Location 1 | Approximately 200 plants on steep, uphill slope with open canopy at potential staging area at PM 19.80 (PC1-IRBR-1) |
| | | | | Approximately <0.5% aerial cover in the polygon labeled PC1-IRBR-2 on the Locations of Rare Plants map. Plants are under and behind the metal beam guard rail to be replaced on the south side of the road, west of the proposed retaining wall. |
| | | | | Approximately 2% cover in the polygon labeled PC1-IRBR-3. Plants are scattered north of roadside ditch, within 1st 10-20 ft from ground and going up the slope, west of western scarp on the north side of the road. |
| | | | | Fewer than 10 plants scattered in the polygon labeled PC1-IRBR-4. Plants are north of roadside ditch, within 1st 10-20 ft from ground and going up the slope, between 2 scarps on the north side of the road.. |
| | | | | Approximately <1% cover in the polygon labeled PC1-IRBR-5. Plants are north of ditch, within 1st 10-20 ft from ground and going up the slope, west of large eastern scarp on the north side of the road. |
| <i>Iris bracteata</i> Siskiyou iris | 3.3 | S3.3?, G4G5 | The Narrows | Approximately <0.5% cover in polygons labeled N-IRBR-1 through -4. Plants scattered on slope above (north of) the highway, including above proposed slope removal, and possibly on slope below highway |
| <i>Iris bracteata</i> Siskiyou iris | 3.3 | S3.3?, G4G5 | Patrick Creek Narrows Location 2 | Approximately 3% cover in an approximately 1000 sq ft area in the polygon labeled PC2-IRBR-1; the rest of the polygon has approximately <0.5% cover. Plants are on large proposed cut slope southwest of bridge on the west side of the road. |
| | | | | Approximately 3% cover in the polygon labeled PC2-IRBR-3. Plants are on an existing cut slope, very close to the southwest corner of the existing bridge on the west side of the road. |
| | | | | 1 clump approximately ½ way from the bridge to the northern limits of the project, labeled as PC2-IRBR-9, on the west side of the road. |
| | | | | In the polygon labeled PC2-IRBR-8 on the west side of the road, approximately 5-7% cover north of the short skid road extending from the highway to the river at an approximate 60 degree angle, and approximately 2% cover just west of the highway shoulder between the short skid road and the northern limits of the project to the highway curve. |

| Species | CRPR Status ^a | State and Global Rank ^a | Project Site ^b | Location and Habitat (Label per species polygon ^c) |
|--|--------------------------|------------------------------------|-----------------------------------|--|
| | | | | From south to north, on the east side of the road: 6 clumps of varying sizes (none greater than 1 ft diameter) in the vicinity of where the proposed retaining wall work will be (point labeled PC2-IRBR-4); 4 clumps (none greater than 1 ft diameter) in the vicinity of the road realignment (point labeled PC2-IRBR-5); 2 clumps approximately 1-ft diameter on the face of the existing cut slope in the vicinity of the proposed road realignment (point labeled PC2-IRBR-6) In the polygon north of the proposed road disturbance (PC2-IRBR-7) on the east side of the road, percent cover varies from south to north within the polygon, from approximately 10%, to approximately 2%, to approximately ~3% cover. The center of the polygon is very shaded and may not provide adequate sunlight for this iris species. |
| <i>Iris bracteata</i> Siskiyou iris | 3.3 | S3.3?, G4G5 | Patrick Creek Narrows Location 3 | Approximately 8 plants on gentle slope in semi-open canopy, southeast of private driveway on northbound side of highway (PC3-IRBR-1) |
| <i>Iris bracteata</i> Siskiyou iris | 3.3 | S3.3?, G4G5 | Washington Curve | Approximately 3-5% cover in an area west of the proposed cut limits on steep uphill slope(WC-IRBR-1). Approximately <0.5% cover within proposed cut limits (WC-IRBR-2). |
| <i>Iris bracteata</i> Siskiyou iris | 3.3 | S3.3?, G4G5 | Outside of proposed project areas | Thousands of plants on slopes and road shoulders along US 199 (not shown on map; observed during spring 2011 site visits) |
| CRPR 4 | | | | |
| <i>Cypripedium californicum</i> California lady's-slipper | 4.2 | S3.2, G5 | Patrick Creek Narrows Location 1 | PM 20.57 along seep/stream on moist serpentine soils at base of steep cut bank on uphill (north) side of road; 25 plants (PC1-CYCA-1) PM 20.58 along seep/stream on moist serpentine soils at base and lower slope of steep cut bank on uphill (north) side of road; ~90 plants (PC1-CYCA-2) |
| | | | The Narrows | In seep on steep rocky bank on northwest side of road; ~10–20 plants (N-CYCA-1) |
| <i>Darlingtonia californica</i> California pitcherplant | 4.2 | S3.2, G3G4 | Patrick Creek Narrows Location 1 | Serpentine seep at the east end of the project site on north side of road, and along small stream that flows out from it parallel to road shoulder; approximately 50 plants, or ramets (PC1-DACA-1) |
| <i>Erigeron cervinus</i> Siskiyou daisy | 4.3 | S3.3, G3 | Patrick Creek Narrows Location 2 | On mossy rocks on the left bank of the Middle Fork Smith River, about 400 feet downstream from bridge; 1 plant (PC2-ERCE-1) |
| | | | | On mossy rocks on the left bank of the Middle Fork Smith River, about 300 feet upstream from bridge; ~50 plants (PC2-ERCE-2) |
| <i>Lathyrus delnorticus</i> Del Norte pea | 4.3 | S3.3, G4 | Patrick Creek Narrows Location 3 | In roadside ditch at east end of project site; 1 plant (PC3-LADE-1) |
| <i>Lomatium howellii</i> Howell's lomatium | 4.3 | S3.3, G4G5 | Patrick Creek Narrows Location 1 | At base of cut bank on serpentine soils on uphill side of road at PM 20.52; ~55 plants (PC1-LOHO-1) |

| Species | CRPR Status ^a | State and Global Rank ^a | Project Site ^b | Location and Habitat (Label per species polygon ^c) |
|---|--------------------------|------------------------------------|----------------------------------|---|
| | | | | At top of bank on south side of road, just below guard rail; 2 plants (PC1-LOHO-2) |
| | | | | At base of cut bank on serpentine soils on uphill side of road at PM 20.62; 20 plants (PC1-LOHO-3) |
| <i>Poa piperi</i> Piper's blue grass | 4.3 | S3.3, G4 | Patrick Creek Narrows Location 1 | On road shoulder adjacent to guard rail on south side of road (PC1-POPI-1), and on steep slope below; 20 plants, and approximately 30 plants at potential staging area at PM 19.80 (PC1-POPI-2) |
| | | | The Narrows | At base of very steep slope on north side of road; 3 plants (N-POPI-1), |
| | | | Washington Curve | On steep cut bank above road near PM 26.5; ~ 10 plants (WC-POPI-1) |
| <i>Salix delnortensis</i> Del Norte willow | 4.3 | S3.3, G4 | Patrick Creek Narrows Location 1 | At base of cut bank and roadside swale on moist serpentine soils on uphill side of road at PM 20.52, 120 plants, mostly small (PC1-SADE-1); also approximately 15 plants on uphill slope at potential staging area at PM 19.80 (PC1-SADE-2) |
| | | | The Narrows | At base of very steep slope on north side of road; 1 plant (N-SADE-1) |
| <i>Saxifraga howellii</i> Howell's saxifrage | 4.3 | S3.3, G4 | Patrick Creek Narrows Location 2 | On mossy rocks on the left bank of the Middle Fork Smith River, about 100 feet downstream from bridge; hundreds of plants (PC2-SAHO-1) |
| | | | | On mossy rocks on the left bank of the Middle Fork Smith River, about 300 feet upstream from bridge; hundreds of plants (PC2-SAHO-2) |
| <i>Thermopsis gracilis</i> var. <i>gracilis</i> Slender false lupine | 4.3 | S3.3, G4T3T4 | Washington Curve | At top of steep cut bank near PM 26.50; dense patch of stems, approximately 3 x 1 meters (WC-THGRG-1) |

^a See Appendix N for explanation of CRPR status and global and state rank.

^b Patrick Creek Narrows Location 1 and the Narrows are in Hurdygurdy Butte USGS 7.5-minute quadrangle; Patrick Creek Narrows Locations 2 and 3 and Washington Curve are in the Shelly Creek Ridge quadrangle.

^c Label per species polygon refers to the label shown on each Locations of Rare Plants map (Addendum to NES 2012).

that, while these plant species may be considered sensitive, they are not rare or unique in the project area (see ICF International 2010 for further details).

Patrick Creek Narrows Location 1

Two special-status plants were recorded at this location: yellow-tubered toothwort (along the highway shoulders to the west of the proposed retaining wall, 20–30 plants) and horned butterwort (25–30 plants in the *Darlingtonia* seep at the western end of the project location). More horned butterwort (5-10) plants occurs on the steep slope at a seasonal seep at the potential staging area at PM 19.80.

Five CRPR 4 plants were recorded: Howell's lomatium, Piper's bluegrass, Del Norte willow, California lady's slipper, and California pitcher plant. Howell's lomatium (two plants) and Piper's bluegrass (20 plants) were identified during surveys south of US 199 on the slope between the highway and the Middle Fork Smith River. The seeps and ditches along the toe of the slope north of the highway provide habitat for Del Norte willow (120 plants), additional Howell's lomatium (~75 plants), and California lady's-slipper (~115 plants). The small *Darlingtonia* seep at the western end of the project location supports approximately 50 California pitcher plant plants. Del Norte willow (~15 plants) and Piper's bluegrass (~30 plants) was also found on the steep slopes at the potential staging area at PM 19.80 during a site visit in May 2011.

CRPR 3 plant, Siskiyou iris, was not flowering during botanical surveys conducted prior to circulation of the Draft EIR/EA, so these plants were recorded as an unknown species of iris (*Iris* sp.). A variety of factors influence whether plants bloom or emerge as seedlings in a given year, including availability and quantity of air and soil moisture, light, and temperature, plus weather patterns, competition by other plants, ground disturbance, and other factors. The iris plants were not observed blooming for several years, but they were observed flowering during a May 11, 2011 visit to check on the flowering and fruiting success of transplanted yellow-tubered toothwort at Patrick Creek Narrows Location 2. After the iris plants were identified as Siskiyou iris, field reviews were conducted on May 25 and August 26, 2011 to confirm the approximate areas occupied by this species at each location on US 199. This species of iris is unlikely to occur, and was not observed occurring at, Ruby 1 and Ruby 2 on SR 197 because this species tends to occur in shady (and drier) forests, such as pine forests (per on-line Flora of North America, http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=242101695 accessed on 8/7/12). It is reported to occur at 1100-3600 feet in the Klamath Ranges and southern Oregon. Siskiyou iris was scattered on both sides of the highway at Patrick Creek Narrows Location 1, in open and partially shaded canopies on gentle to steep slopes, with aerial percent cover ranging from approximately <0.5% to approximately 2% in polygons on the Locations of Rare Plants map. Percent cover was generally used to quantify amount of Siskiyou iris since iris plants are clonal and the size of clumps varies. Counting the number of plants or clumps does not provide an indication of the area occupied by this species. Approximately 200 Siskiyou iris plants (percent cover was not assessed at the potential staging area) also occurred along the uphill slope at the potential staging area at PM 19.80.

Patrick Creek Narrows Location 2

Numerous (approximately 1,190 to 2,200) yellow-tubered toothwort (*Cardamine nuttallii* var. *gemmata*) plants were identified at this location between 2008 and 2011. This plant is a CRPR

1B.3 plant (rare, threatened, or endangered in California and elsewhere), and not very threatened in California (low degree/immediacy of threats or no current threats known). This plant is locally abundant, but rare elsewhere. In an email to the Department on August 4, 2009, John McRae (Six Rivers National Forest Botanist) said there have been about 25 reported occurrences of this species in the project vicinity, and it has no special status there with the Forest Service.

One other special-status plant was recorded at this location: Coast Range lomatium (*Lomatium martindalei*) (25 plants).

Two CRPR 4 plant species were recorded in the proposed area of direct impact at this location: Siskiyou daisy (about 51 plants) and Howell's saxifrage (100s of plants).

Siskiyou iris, a CRPR 3 plant, was also found in May 2011 at this location. The occurrences were mapped as polygons on the Locations of Rare Plants map during the same site visits as discussed for Patrick Creek Narrows Location 1. Siskiyou iris was scattered on both sides of the highway at Patrick Creek Narrows Location 2, in open and partially shaded canopies on gentle to steep slopes, with aerial percent cover ranging from approximately <0.5% to approximately 10% in polygons on the Locations of Rare Plants map.

Patrick Creek Narrows Location 3

A small group of yellow-tubered toothwort plants (six plants) were found in the proposed area of direct impact in an area south of the proposed wall (east of the highway). A single Del Norte pea, a CRPR 4 plant, was found west of the highway at the north end of Patrick Creek Narrows Location 3.

The Narrows

No special-status plants were found in the proposed area of direct impact at this project location. Three CRPR 4 plants were found along the road shoulder on the north side of the road: Del Norte willow (one plant), Piper's bluegrass (three plants), and California lady's-slipper (and ~10–20 in a small hillside seep).

Siskiyou iris was also found in May 2011 at this location. The occurrences were mapped as polygons on the Locations of Rare Plants map during the same site visits as discussed for Patrick Creek Narrows Location 1. Siskiyou iris was scattered on the north side of the road on steep, open canopied slopes, with an estimated <0.5% cover in polygons on the Locations of Rare Plants map.

Washington Curve

No special-status plants were found in the proposed area of direct impact at this project location. Two CRPR 4 plants were found on the steep bank on the north side of the road: slender false lupine (a dense patch of stems 3.5 feet by 15.5 feet) and Piper's bluegrass (three plants).

Siskiyou iris was also found in May 2011 at this location. The occurrences were mapped as polygons on the Locations of Rare Plants map during the same site visits as discussed for Patrick Creek Narrows Location 1. Siskiyou iris was scattered on the north side of the road on steep, partially closed or closed canopied slopes, with approximately 3-5% cover in an area west of the

proposed cut limits, and approximately <0.5% cover within proposed cut limits, in polygons on the Locations of Rare Plants map.

Bryophytes, Fungi, and Lichens

Surveys are required for specific Survey and Manage (S&M) species prior to disturbance on federal lands to be in compliance with the Presidential Record of Decision—Standards and Guidelines (ROD) of 1994, 2001, and 2003. S&M lichens, bryophytes, and fungi, collectively known as cryptogams,⁶ play many important roles in healthy ecosystems. The survey was conducted per 2001 protocol for the Department in project areas within Six Rivers National Forest on US 199 in fall 2008 and spring 2009.

Two S&M species were located during field surveys, one within the project boundary on US 199, the other just outside. The foliose lichen, lettuce lichen (*Lobaria oregana*) was found on the duff under old Douglas-firs and draping the understory at Patrick Creek Narrows Location 2. This small old grove is bound by road, river, and fire, with serious compaction and disturbance problems. In spite of this, the grove has good potential for S&M species and fits most criteria for suitable habitat.

The other S&M species, *Cantharellus subalbidus*, is a category D (uncommon) fungal species. It was found just beyond the boundary of the Washington Curve site, the most prolific location for fungi in the project area. Five different *Ramaria* species were also at the Washington Curve site, but none were S&M species. Although the fungal fruiting season was relatively good, there were few good potential mushroom habitats in the project area on US 199. Most terrestrial fungi require a decent organic layer and do not do well on scree slopes and rocky cliffs, the makeup of much of the BSA. Very few cryptogams were found on the snags or individual trees on those slopes.

2.3.3.3 Environmental Consequences

Effects on Non-Special-Status Plants

The impact of construction of the proposed project at all project locations on non-special-status plants would consist of the loss of habitat and displacement. The project would result in localized effects to plant species. The proposed project and area of impact are located at the edge of higher quality habitat for plant species.

The Patrick Creek Narrows (Locations 1, 2, and 3), the Narrows, and Washington Curve project sites are adjacent to the Six Rivers National Forest. This area supports a large variety of non-special-status species. The proposed project would affect edges of potential habitat along the highway and outside the areas of higher quality habitat. The areas of plant habitat that would be removed are listed in Table 2.3.3-4. However, construction activities would occur mostly in areas that are already currently disturbed.

⁶ *Cryptogams* are plants that reproduce by spores.

Table 2.3.3-4. Proposed Area of Plant Habitat to Be Disturbed and Removed at Each Project Site and Alternative

| Project Location and Alternative | Proposed Area of Plant Habitat to Be Temporarily Disturbed and Restored (acres) by Location and Alternative | Proposed Area of Plant Habitat to Be Permanently Removed (acres) by Location and Alternative |
|---|--|---|
| Patrick Creek Narrows Location 1 | 0.25 | 0.01 |
| Patrick Creek Narrows Location 2, Upstream Bridge Replacement Alternative | 3.0 | 0.86 |
| Patrick Creek Narrows Location 2, Downstream Bridge Replacement Alternative | 3.0 | 0.79 |
| Patrick Creek Narrows Location 2, Bridge Preservation with Upslope Retaining Wall Alternative | 2.0 | 0.70 |
| Patrick Creek Narrows Location 3 | 0.3 | 0.1 |
| The Narrows | 0.4 | 0.2 |
| Washington Curve, Cut Slope Alternative | 0.1 | 0.9 |
| Washington Curve, Retaining Wall Alternative | 0.6 | 0.9 |

Effects on Special-Status and California Rare Plant Rank (CRPR) 3 and 4 Plants and Bryophytes, Lichen, and Fungi

No effects on special-status or CRPR 3 and 4 plants, or special-status bryophytes, lichen, or fungi would occur at Ruby 1 or Ruby 2 because none were found at these sites. CRPR 1B, 3, and 4 plant species may be removed at all three Patrick Creek Narrows locations, but no special-status bryophytes, lichens, or fungi would be removed at these locations. There are no special-status bryophytes, or fungi at any of the Patrick Creek Narrows locations. The only special-status lichen species is at Location 2, and it would be avoided. CRPR 3 and 4 plant species would be permanently affected at the Narrows, as detailed below. No special-status plants, bryophytes, lichens, or fungi were found at the Narrows. No special-status plants, bryophytes, or lichens are within proposed construction areas at the Washington Curve site. The CRPR 3 and 4 sensitive plant populations and special-status fungus would be avoided. The special-status and CRPR 3 and 4 species outside of the construction areas, at/near potential staging areas, would not be disturbed, since they are off of the paved and graveled surfaces where staging would occur.

Patrick Creek Narrows Location 1

Several populations of special-status and CRPR 3 and 4 plants were recorded at this location. The placement of the retaining wall south of the highway would affect two CRPR 4 species—Howell’s lomatium (two plants) and Piper’s bluegrass (20 plants)—that are present south of US 199 on the slope between the highway and the Middle Fork Smith River.

After circulation of the Draft EIR/EA, further design work lead to recognition by the Department that the entire length of metal beam guard rail needed to be replaced. This additional work may affect the approximately 20-30 scattered plants of yellow-tubered toothwort (polygon PC1-CANUG-2 on the Location of Rare Plants map for this location) and approximately 2-3 clumps of Siskiyou iris (polygon PC1-IRBR-2) at this location. Most of the Siskiyou iris clumps in this polygon, and clumps in the other polygons of Siskiyou iris, would not be affected by proposed

project activities. Also, further design work lead to a need to recontour the drainage ditch on the uphill side of the highway. This work would not affect the Del Norte willow on the slope, as long as the recontoured ditch was compacted using hand-held tools, rather than a heavy equipment roller. The lowest portions of the two polygons (PC1-LOHO-1 and -3) containing approximately 55 and 20 Howell's lomatium plants on the uphill side of the road may be affected by fill placed during recontouring of the adjacent drainage ditch. None of these plants were found during site visits on May 11, 2011 and May 25, 2011 by Department Botanists. The reason for the absence of these plants is unclear; it may have been related to a later blooming season, as observed by multiple Department botanists in 2011, or conditions were unfavorable for blooming of this species in 2011, or the plants were covered by so much slide material during landslides that happened in 2009/2010 that they were killed or temporarily unable to emerge. This vicinity is known for being an active slide area and is typically signed as such during winter months. The California lady's-slipper orchid, California pitcher plant, and horned butterwort plants at this location are far enough away from proposed project activities that they would not be affected. Also, the drainage patterns and anticipated runoff would essentially be maintained as it currently exists, so the proposed project would not affect these plants hydrologically. The Siskiyou iris, Piper's bluegrass, horned butterwort, and Del Norte willow at the potential staging area at PM 19.80 would not be affected by proposed project activities since they are on the uphill slope where no work would occur.

Patrick Creek Narrows Location 2

Several populations of special-status and rare plants were recorded at this location. Proposed bridge work and road realignment at Patrick Creek Narrows Location 2 would affect areas of one special-status plant, yellow-tubered toothwort. This plant is locally abundant, but rare elsewhere. In his email from August 2009, John McRae (Six Rivers National Forest Botanist) said there have been about 25 reported occurrences of this species in the project vicinity, and it has no special status with the Forest Service. All three alternatives involve a slope cut west of the highway that would remove approximately 30–40 yellow-tubered toothwort plants in polygon PC2-CANUG-2, south of the bridge. Each of the alternatives avoids effects to other polygons of yellow-tubered toothwort at Patrick Creek Narrows Location 2, except where noted below. One other special-status plant, Coast Range lomatium, would not be affected. Several populations of CRPR 4 plants, including Siskiyou daisy and Howell's saxifrage, were recorded at this location, but these would not be affected. None of the 3 alternatives would have an effect on the special-status lichen.

Siskiyou iris, a CRPR 3 species, would be affected by proposed bridge and road realignment activities. Of the polygons indicating Siskiyou iris on the Locations of Rare Plants map for this project location, irises in the polygon PC2-IRBR-1 and a small portion of the plants on the face of the cut slope in (i.e., a sliver in the westernmost portion of) the polygon labeled PC2-IRBR-2 would be removed to accommodate the proposed road realignment, regardless of alternative. Each of the alternatives avoids effects to other polygons of Siskiyou iris at Patrick Creek Narrows Location 2, except where noted below.

Upstream Bridge Replacement Alternative

In addition to the plants impacts listed above, this alternative would remove the most southerly 10% of an area that includes approximately 50 yellow-tubered toothworts in the polygon labeled PC2-CANUG-5, west of the highway and north of the bridge; so, proposed work would affect

approximately 5–10 plants in this polygon. This alternative would also remove the 5 yellow-tubered toothwort plants in polygon PC2-CANUG-3 and the Siskiyou iris plants in the polygon PC2-IRBR-3.

Downstream Bridge Replacement Alternative

In addition to the plant impacts listed under Patrick Creek Narrows Location 2 above, this alternative may affect about 10 % of the yellow-tubered toothwort population that occupies the habitat east of the highway and north of the bridge, in the polygon labeled PC2-CANUG-4. This polygon was estimated to contain 1,000–2,000 plants during pre-DED surveys, so up to approximately 100-200 of these plants in this polygon would be removed. This alternative would avoid affecting a the yellow-tubered toothwort plants in polygons PC2-CANUG-3 and PC2-CANUG-5 that the upstream alignment would remove.

After circulation of the DEIR/EA, further design work with computer modeling determined more exact alignment needs. That design work revealed that the alignment needed to be adjusted slightly at this location to accommodate STAA trucks and other large vehicles, so that a narrow sliver cut may need to occur on the face of the cut slope that is southeast of the bridge, where some yellow-tubered toothwort plants in the polygon PC2-CANUG-1 exist; effects to Siskiyou iris in this vicinity are discussed above. A site review was conducted on May 11, 2011 along the newly proposed curve adjustment to confirm the number of yellow-tubered toothwort plants in polygon PC2-CANUG-1 that might be affected. As mentioned in Table 2.3.3-3, approximately 70 additional plants were found that were not apparent during the spring 2008 survey; approximately 20-30 of those plants would be affected by the newly proposed curve adjustment.

Siskiyou iris plants represented by the points labeled PC2-IRBR-4, -5, and 6 on the Locations of Rare Plants map would be removed with the proposed downstream alignment, in addition to the iris plants noted to be removed regardless of alternative. This alternative would avoid the Siskiyou iris polygon PC2-IRBR-3 that the upstream alignment would remove.

Bridge Preservation with Upslope Retaining Wall Alternative

In addition to the plant impacts listed under Patrick Creek Narrows Location 2 above, this alternative affects about 5% of the yellow-tubered toothwort plants that occupy the habitat east of the highway and north of the bridge, in the polygon labeled PC2-CANUG-4. This polygon contains 1,000–2,000 plants. It is estimated that no more than 5% of these plants would be removed.

This alternative would also remove Siskiyou iris in the polygon PC2-IRBR-3 and possibly in polygons PC2-IRBR-5 and -6.

Patrick Creek Narrows Location 3

The downslope retaining wall or culvert work proposed at Patrick Creek Narrows Location 3 may affect the 6 yellow-tubered toothwort plants in polygon PC3-CANUG-2. A single Del Norte pea (CRPR 4.3) plant was found west of the highway at the northern post mile limits of Patrick Creek Narrows Location 3. This plant would not be affected because no work will be done in that area. A small portion of the yellow-tubered toothwort in polygon PC3-CANUG-7 would also possibly be affected if the area beyond the paved shoulder, south of the private driveway, was used as a potential staging area. The Siskiyou iris plants in polygon PC3-IRBR-1 would also

possibly be affected by this same potential staging area. The other polygons of yellow-tubered toothwort (PC3-CANUG-3, -4, -5, and -6) included on the Locations of Rare Plants maps for this location would not likely be affected because they are beyond the paved or graveled surfaces of potential staging areas.

The Narrows

The slope cut at the Narrows would remove one Del Norte willow, three Piper's bluegrass, ~10–20 California lady's-slipper, and the Siskiyou iris polygons north of US 199. No other rare plants were found in the potential area of ground disturbance of this location. Special-status and CRPR 3 and 4 plant species that were observed to occur above and to the west and east of the limits of proposed slope cut (not mapped) would not be affected by proposed project activities.

Washington Curve

Both alternatives proposed for Washington Curve would have no effect on two populations of CRPR 4 plant species: slender false lupine and Piper's bluegrass. No special-status or other rare plants were found in the botanical survey area at Washington Curve. Neither alternative would have an effect on the sensitive fungus. The Siskiyou iris plants in polygon WC-IRBR-1 would be avoided, but those in polygon WC-IRBR-2 would be removed by construction activities.

No Build (No Action) Alternative

Under the No Build (No Action) Alternative, there would be no construction and therefore no potential for construction activities to affect special-status or sensitive plants, bryophytes, lichens, and fungi.

2.3.3.4 Avoidance, Minimization, and/or Mitigation Measures

Minimize Effects on Special-Status and California Rare Plant Rank (CRPR) 3 and 4 Plants, Lichen, and Fungi

All special-status lichen and fungi identified during botanical surveys will be avoided.

Typically, mitigation is proposed when potential effects on special-status or listed plant species are anticipated to be adverse. With the exception of one special-status species, yellow-tubered toothwort (CRPR 1B.3), all sensitive plant species that would be affected by proposed construction activities (i.e., California lady's-slipper, Howell's lomatium, Piper's bluegrass, Del Norte willow, and Siskiyou iris) are CRPR 3 or 4 species and considered uncommon but generally not special-status. Potential effects to yellow-tubered toothwort at the Patrick Creek Narrows Locations 1 through 3 are higher than anticipated prior to circulation and comments on the DEIR/EA (i.e., currently, approximately 266-386 yellow-tubered toothwort plants are anticipated to be potentially affected out of approximately 1,431-2,451 plants, or approximately 11-27%, compared to 3-10% estimated plants to be affected in the DEIR/EA). The number of plants anticipated to be affected is still low when considering the abundance of this species in the vicinity of the US 199 corridor and on lands that are outside of proposed areas of ground disturbance, such as the approximately 25 occurrences on Six Rivers National Forest lands. The Department coordinated with DFG and determined that additional potential effects would not be adverse or cumulatively significant due to the abundance of occurrences of this species at Patrick Creek Narrows Locations 1-3, along and adjacent to US 199, and on Six Rivers National Forest

lands (LaBanca pers. comm. 7/8/11) The Avoidance, Minimization, and/or Mitigation Measures, below, for yellow-tubered toothwort will assist in avoiding and minimizing impacts to this species. DFG concurred with this finding during the 7/8/11 phone discussion. So, mitigation for potential effects to yellow-tubered toothwort is not necessary.

Impacts on CRPR 4 species are generally not mitigated unless the population is significant, but good stewardship and recognition of the potential importance of the CRPR 3 and 4 species occurring within project limits prompts the Department to assess and attempt minimization measures for species that would be affected by proposed construction activities. As noted above, only five (of ten) CRPR 3 and 4 species within project areas would be affected by project activities. One of the CRPR 4 species that would be affected by proposed construction is California lady's-slipper, a CRPR 4.2 species. This species is more sensitive than CRPR 4.3 species because it is threatened by horticultural collecting and logging; many protected populations on Forest Service land are not reproducing; and its habitat is restricted to wet areas, usually associated with serpentine, an uncommon soil/habitat (California Native Plant Society 2010). Although this species is more sensitive than other CRPR 4 species within project limits, only ~8 to 15% of plants within project areas would be affected, and minimization measures are proposed below in an attempt to offset effects to this species at the Narrows. The other CRPR 4.2 species is California pitcherplant; it is threatened by horticultural collecting and mining and is restricted to generally serpentine seeps or wet areas, which are also uncommon habitats. Construction activities have been amended to avoid potential effects to this species.

The minimization measures proposed below are for one special-status species, yellow-tubered toothwort, and for the following sensitive species: California lady's-slipper, Howell's lomatium, Piper's bluegrass, Del Norte willow, and Siskiyou iris, all of which occur in areas anticipated to have construction impacts.

Designate and Fence Environmentally Sensitive Areas for Sensitive Plants, Lichen, and Fungi and Their Habitats

The Department will avoid and minimize potential impacts on sensitive plants and sensitive plant habitat to the greatest extent practicable during project construction.

Wherever any sensitive plants are close to construction, staging, or disposal areas, temporary exclusionary fencing or stakes/flagging will be placed to protect them, buffering them from disturbance. These areas will be designated as Environmentally Sensitive Areas and shown on the project plans. No construction workers or construction equipment will be permitted in these areas.

Relocate Sensitive Plants, When Possible

The Department will attempt to relocate special-status and sensitive (i.e., all CRPR) plants that are in areas of soil disturbance. These will be salvaged with methods appropriate to the particular species (i.e., digging up and replanting clumps of yellow-tubered toothwort tubers at Patrick Creek Narrows Locations 2 and 3; collecting and sowing seed of Piper's bluegrass at Patrick Creek Narrows Location 1 and the Narrows and potentially transplanting some plants; digging up rhizome clusters and surrounding soil of California lady's-slipper at the Narrows; collecting

and sowing seed from Howell's lomatium at Patrick Creek Narrows Location 1; and taking and replanting Del Norte willow cuttings at the Narrows; and digging up rhizome clusters and replanting clumps of Siskiyou iris at Patrick Creek Narrows Location 2 and possibly Locations 1 and 3). Experimental trials of proposed minimization measures were conducted in 2010 for yellow-tubered toothwort to determine the feasibility and potential success of the proposed measures. These trials occurred in areas where proposed construction impacts are likely, and transplantation occurred nearby but outside proposed project limits and in suitable habitat. This occurred in consultation with the Forest Service. The Department monitored the results of the trials in 2011 and 2012 and determined the trials to be successful. The measures will be expanded to encompass remaining yellow-tubered toothwort areas anticipated to be affected. Replanting will occur in suitable habitat in the project vicinity within the Department's right-of-way or in a location agreed upon by the Department and the landowner of the parcel where transplanting is proposed. Transplants will be monitored for a 3-year period to assess successful re-establishment of at least some individuals of the transplanted species and success of the transplanting techniques used.

Some studies show that transplantation is often unsuccessful (e.g., Fiedler 1991 in California Native Plant Society 1998) and not considered viable mitigation by the CNPS and others for project impacts on rare and listed plant species (California Native Plant Society 1998). However, transplantation is proposed as a minimization measure for California lady's-slipper, a sensitive but not rare species, at the Narrows in an attempt to maintain genetic diversity and minimize loss of individuals that would occur if no minimization measures were implemented.

Successful re-establishment will be assessed by recording survival of transplanted material or obvious expression of germinated seed, such as concentrations in the area that was seeded. Results will be noted in the monitoring reports. The Department acknowledges that the proposed transplanting and seed collection is experimental. Attempts to assist in re-establishing existing genetic diversity and individuals combined with weeding of invasive plant species in disturbed soil areas is responsible stewardship and will increase knowledge of sensitive plant re-establishment.

Natural seed dispersal by multiple native plant species above proposed cut limits is anticipated to occur after proposed slope cuts are constructed, which would assist in re-establishing native vegetation in areas on the new cut slopes that contain soil. Some proposed cut slopes are anticipated to be composed primarily of rock after construction. Seed dispersal down slopes and across the highway, likely occurring by a combination of gravity, wind, water, erosion, and landslides/rockslides, is apparent in patterns of plant species occurrences observed during botanical surveys.

Implement Invasive Weed Control Program

As a compensatory measure to improve habitat for native plants in and adjacent to disturbed soil areas at project locations and to minimize competition from non-native/invasive plants, the Department will implement a 3-year program of invasive weed control in all areas of disturbed soil.

2.3.4 Animal Species

This section contains no significant changes and is not being recirculated.

2.3.5 Threatened and Endangered Species

This section contains no significant changes and is not being recirculated.

2.3.6 Invasive Species

This section contains no significant changes and is not being recirculated.

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Appendix E Minimization and/or Mitigation Summary

This Summary only includes the additional measures which were added to Section 2.3.1, for a complete list of minimization and/or mitigation measures for the project see the original draft Appendix E.

Protect Roots of Large Old Redwood Trees

At both project locations on SR 197, many large old redwood trees (with a dbh of more than 36 inches) are within the project area. To minimize potential impacts on these trees, only hand tools or a pneumatic excavation tool (such as an Air Spade) will be used for excavation within the Structural Root Zone of large old redwood trees. The Structural Root Zone of a tree is a circular area (the tree trunk is at the center of the circle) with a radius three times the dbh of the trunk. Only an air spade or handwork will be used for excavation within the Structural Root Zone of redwood trees that are 36 inches dbh or greater. The pneumatic excavation tool turns compressed air into a high speed air jet, which dislodges soil particles but does not harm solid material, such as tree roots. This is a tool commonly used by arborists when it is necessary to excavate within the root zone of a tree. Within the Structural Root Zone, any root encountered that needs to be removed will be cut cleanly to optimize healing potential.

The following avoidance and minimization measures will be implemented for work near large old trees:

- An arborist shall be present to monitor any ground disturbing construction activities.
- All excavation below the finish grade within a setback equal to three times the diameter of any large old trees shall be conducted with hand tools, Air-Spade or other methods approved by the construction engineer and arborist to minimize disturbance or damage to the roots with exception of culvert work. Mechanized equipment can be used at the culvert locations upon approval of the construction engineer.
- The contractor will be required to use a pneumatic excavator (such as an Air-Spade) while excavating the soil within the structural root zone of trees greater than 36 inches dbh to minimize physical injury to the tree roots.
- Smaller roots, less than 2 inches in diameter, that must be cut, shall be cut cleanly with sharp instruments in order to promote healing. Roots larger than 2 inches diameter will not be cut.
- After construction cut and fill slopes will be replanted.
- Prior to excavation or fill the upper four to six inches of duff and native soil will be set aside for placement on the finished slopes to provide the nutrients and seedbank for natural revegetation.

- To help minimize potential stress on the large trees during construction, watering will be provided. In areas where roadway excavation will take place below the finish grade within the structural root zone of tree 36 inches dbh or greater, watering equivalent to ½ inch depth to an area defined as from the edge of existing pavement to 25 feet beyond the edge of pavement shall be performed. Watering shall be performed not more than 24 hours after the roadway excavation work at a site and shall occur weekly thereafter between the dates of June 1st and September 30th.
- Any duff layer shall be raked off the area within the clearing limits, stored, and replaced as erosion control. For areas within the structural root zone of trees 36 inches dbh or greater, the duff will be hand raked.
- Where feasible and appropriate, structural fill will use one of the following methods to increase air and water porosity, minimize compaction of roots, decrease thickness of structural section, and/or minimize thermal exposure to roots from Hot Mix Asphalt paving:
 - a 0.75 foot thick layer of Class 1, Type A permeable material shall be placed and compacted as the first lift of the fill to increase water infiltration and air circulation, or
 - Cement Treated Permeable Base (CTPB) will be considered, or
 - Cornell Mix or CU-Structural Soil will be considered
- In locations where greater than 4 inches of fill would be placed next to the trunk of a tree greater than 36 inches dbh, a brow log shall be used to keep the soil from the tree trunk to increase air circulation.
- Equipment staging areas/storage areas shall be on the paved roadway or on existing unvegetated gravel/paved pullouts so there will be no staging in sensitive natural communities.
- The contract will state that no heavy equipment will be staged or parked within the drip line of large old trees, except in improved areas (paved or graveled).

Mitigation for Impacts on Old-Growth Redwoods

If one of the Ruby 2 alternatives that would remove old growth redwood trees is selected, off-site or out-of-kind mitigation would be required. This would include measures that indirectly benefit old growth redwoods and associated plant and animal species. Some options for off-site or out-of-kind mitigation include:

- Purchasing acreage of existing old growth redwoods in nearby private ownership and transferring it to a non-profit conservation organization (such as Save-the-Redwoods League), or to a County, State, or National Park.
- Removal of invasive exotic plant species within the Department's right-of way in the Ruby 2 project vicinity to enhance habitat for native redwood forest species.
- Provide corvid-proof trash containers in nearby Ruby Van Deventer Park (corvids such as crows, ravens, and jays eat the eggs of marbled murrelets).

Appendix N. Plant Species Observed in the Study Area.

Compiled from ICF Jones Stokes and Caltrans surveys; nomenclature follows *The Jepson Manual* (Hickman 1993) and online updates.

| Scientific Name (* = non-native species) | Common Name | Family | Patrick Creek | | | | The Narrows | Washing-ton Curve | Ruby 1 | Ruby 2 |
|---|----------------------|----------------------------|---------------|--------|--------|--------|-------------|-------------------|--------|--------|
| | | | All | Loc. 1 | Loc. 2 | Loc. 3 | | | | |
| Trees | | | | | | | | | | |
| <i>Acer macrophyllum</i> | bigleaf maple | Aceraceae | | x | x | x | x | | x | x |
| <i>Alnus rhombifolia</i> | white alder | Betulaceae | | x | x | | | x | | |
| <i>Alnus rubra</i> | red alder | Betulaceae | | | | x | x | | x | x |
| <i>Arbutus menziesii</i> | Pacific madrone | Ericaceae | | x | x | x | x | x | | |
| <i>Calocedrus decurrens</i> | incense cedar | Cupressaceae | | x | x | | x | x | | |
| <i>Chamaecyparis lawsoniana [Cupressus l.]</i> | Port Orford cedar | Cupressaceae | | x | | | | | x | |
| <i>Chrysolepis chrysolepis</i> | chinquapin | Fagaceae | | | x | | | x | | |
| <i>Cornus nuttallii</i> | Pacific dogwood | Cupressaceae | | | x | x | | | | |
| <i>Fraxinus latifolia</i> | Oregon ash | Oleaceae | | | | | x | | | |
| <i>Lithocarpus densiflorus</i> var. <i>densiflorus</i> | tanoak | Fagaceae | | x | x | x | x | x | | x |
| <i>Malus</i> sp. * | cultivated apple | Rosaceae | | | | | | | | x |
| <i>Myrica californica [Morella c.]</i> | Pacific bayberry | Myricaceae | | x | | | | | | |
| <i>Picea sitchensis</i> | Sitka spruce | Pinaceae | | | | | | | x | |
| <i>Pinus attenuata</i> | knobcone pine | Pinaceae | | | | | | x | | |
| <i>Pinus jeffreyi / ponderosa</i> | yellow pine | Pinaceae | | | | | | x | | |
| <i>Pinus sabiniana</i> | foothill pine | Pinaceae | | | | | x | | | |
| <i>Populus balsamifera</i> ssp. <i>trichocarpa</i> | black cottonwood | Salicaceae | | | x | | | | | |
| <i>Prunus</i> sp. | cherry | Rosaceae | x | | x | | | | | x |
| <i>Pseudotsuga menziesii</i> var. <i>menziesii</i> | Douglas-fir | Pinaceae | | x | x | x | x | x | x | x |
| <i>Quercus chrysolepis</i> | canyon live oak | Fagaceae | | x | x | x | x | x | | |
| <i>Quercus kelloggii</i> | black oak | Fagaceae | | | | | x | | | |
| <i>Salix lasiolepis</i> | arroyo willow | Salicaceae | | x | x | x | x | x | x | |
| <i>Salix sitchensis</i> | Sitka willow | Salicaceae | | | | | | | | x |
| <i>Sequoia sempervirens</i> | coast redwood | Taxodiaceae [Cupressaceae] | | | x | | | | x | x |
| <i>Umbellularia californica</i> | California bay | Lauraceae | | x | x | x | x | x | x | x |
| Shrubs | | | | | | | | | | |
| <i>Acer circinatum</i> | vine maple | Aceraceae | | | x | | | | | |
| <i>Amelanchier alnifolia</i> var. <i>semiintegrifolia</i> | Pacific serviceberry | Rosaceae | | | x | | x | | | |
| <i>Arctostaphylos columbiana</i> | hairy manzanita | Ericaceae | | | | | x | x | | |
| <i>Arctostaphylos glandulosa</i> ssp. <i>glandulosa</i> | Eastwood manzanita | Ericaceae | | | x | | | x | | |
| <i>Arctostaphylos</i> sp. | manzanita | Ericaceae | | x | x | | x | x | | |
| <i>Baccharis pilularis</i> | coyote brush | Asteraceae | | x | x | | x | | | x |
| <i>Berberis aquifolium</i> var. <i>aquifolium</i> | Oregon grape | Berberidaceae | | | x | | | | | |
| <i>Berberis nervosa</i> | Oregon grape | Berberidaceae | | | x | | | | | |
| <i>Berberis pinnata</i> ssp. <i>pinnata</i> | California barberry | Berberidaceae | | | x | | | | | |
| <i>Ceanothus integerrimus</i> | deer brush | Rhamnaceae | | x | x | x | x | x | | |
| <i>Ceanothus pumilus</i> | Siskiyou mat | Rhamnaceae | | x | | | | | | |
| <i>Ceanothus velutinus</i> var. <i>hookeri</i> | snowbrush | Rhamnaceae | | | x | | | x | | |
| <i>Cercis occidentalis</i> | western redbud | Fabaceae | | x | | | | | | |
| <i>Chrysolepis chrysophylla</i> var. <i>chrysophylla</i> | giant chinquapin | Fagaceae | | | x | | | x | | |
| <i>Cornus sericea</i> ssp. <i>sericea</i> | redosier dogwood | Cornaceae | | | | | x | | | |

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| Scientific Name (* = non-native species) | Common Name | Family | Patrick Creek | | | The Narrows | Washing-ton Curve | Ruby 1 | Ruby 2 |
|---|-------------------------------|---------------------------------|---------------|--------|--------|-------------|-------------------|--------|--------|
| | | | All | Loc. 1 | Loc. 2 | | | | |
| <i>Cornus</i> sp. | dogwood | Cornaceae | | | x | | | | |
| <i>Corylus cornuta</i> var. <i>californica</i> | California hazelnut | Betulaceae | | | x | x | | x | x |
| <i>Cotoneaster pannosa</i> * | cotoneaster | Rosaceae | | | | | | x | x |
| <i>Cytisus scoparius</i> * | Scotch broom | Fabaceae | | | x | | x | | |
| <i>Eriodictyon californicum</i> | yerba santa | Hydrophyllaceae | | x | x | | x | | |
| <i>Euonymus occidentalis</i> var. <i>occidentalis</i> | western burning bush | Celastraceae | x | | | | | | |
| <i>Fuchsia magellanica</i> * | hardy fuchsia | Onagraceae | | | | | | x | |
| <i>Garrya buxifolia/flavescens</i> | silk tassel bush | Garryaceae | | x | x | x | | | |
| <i>Gaultheria shallon</i> | salal | Ericaceae | | x | x | | x | x | x |
| <i>Genista monspessulana</i> * | French broom | Fabaceae | | | x | x | x | | |
| <i>Holodiscus discolor</i> | oceanspray | Rosaceae | | x | x | x | x | | x |
| <i>Ilex aquifolium</i> * | holly | Aquifoliaceae | | | | | | x | |
| <i>Ledum glandulosum</i> | western Labrador tea | Ericaceae | | x | | | | | |
| <i>Philadelphus lewisii</i> | Lewis' mock orange | Philadelphaceae [Hydrangeaceae] | | | x | | | | |
| <i>Physocarpus capitatus</i> | Pacific ninebark | Rosaceae | | | | | | x | x |
| <i>Prunus laurocerasus</i> * | cherry laurel | Rosaceae | | | | | | x | x |
| <i>Quercus berberidifolia</i> | scrub oak | Fagaceae | | | | x | x | | |
| <i>Quercus durata</i> | leather oak | Fagaceae | | | | x | | | |
| <i>Rhamnus californica</i> | California coffeeberry | Rhamnaceae | | x | x | | | x | x |
| <i>Rhamnus pushiana</i> [<i>Franqula</i> p.] | casara buckthorn | Rhamnaceae | | x | | | | | |
| <i>Rhododendron occidentale</i> | western azalea | Ericaceae | | x | x | | | | |
| <i>Ribes menziesii</i> | canyon gooseberry | Grossulariaceae | | x | x | x | | | |
| <i>Ribes sanguineum</i> | red-flowering currant | Grossulariaceae | | | x | | | | |
| <i>Ribes</i> sp. | gooseberry | Grossulariaceae | | | x | | | | |
| <i>Rosa gymnocarpa</i> | wood rose | Rosaceae | | | x | x | | | |
| <i>Rosa</i> sp. | rose | Rosaceae | | | | x | x | | |
| <i>Rubus armeniacus</i> [<i>R. discolor</i>] * | Himalayan blackberry | Rosaceae | | x | x | x | x | x | x |
| <i>Rubus leucodermis</i> | black-cap raspberry | Rosaceae | | | x | x | x | | |
| <i>Rubus parviflorus</i> | thimbleberry | Rosaceae | | x | x | x | x | x | x |
| <i>Rubus spectabilis</i> | salmonberry | Rosaceae | | | x | | | x | x |
| <i>Rubus ursinus</i> | California blackberry | Rosaceae | | x | x | x | x | x | x |
| <i>Salix delnortensis</i> | Del Norte willow | Salicaceae | | x | | | x | | |
| <i>Salix sitchensis</i> | Sitka willow | Salicaceae | | | x | | x | | |
| <i>Salix</i> sp. | willow | Salicaceae | | x | x | x | | | |
| <i>Sambucus racemosa</i> var. <i>racemosa</i> | Pacific red elderberry | Caprifoliaceae | x | | | | | x | x |
| <i>Symphoricarpos albus</i> var. <i>laevigatus</i> | snowberry | Caprifoliaceae | | | x | | x | | |
| <i>Symphoricarpos mollis</i> | creeping snowberry | Caprifoliaceae | | | x | | | | |
| <i>Toxicodendron diversilobum</i> | poison-oak | Anacardiaceae | | x | x | x | x | x | x |
| <i>Vaccinium ovatum</i> | black huckleberry | Ericaceae | | x | x | | x | x | x |
| <i>Vaccinium parvifolium</i> | red huckleberry | Ericaceae | | x | x | | x | x | x |
| Herbaceous Plants: Ferns & Relatives | | | | | | | | | |
| <i>Adiantum aleuticum</i> | five fingered maidenhair fern | Pteridaceae | | x | x | | x | x | x |
| <i>Aspidotis densa</i> | cliff brake, lace fern | Pteridaceae | | x | x | | | | |

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|---|--------------------------|------------------|---------------|--------|--------|--------|-------------|-------------------|--------|--------|
| | | | All | Loc. 1 | Loc. 2 | Loc. 3 | | | | |
| <i>Athyrium filix-femina</i> var. <i>cyclosorum</i> | lady fern | Dryopteridaceae | | | | | | | | X |
| <i>Cheilanthes gracillima</i> | lip fern | Pteridaceae | | | X | | X | X | | |
| <i>Cystopteris fragilis</i> | Fragile fern | Dryopteridaceae | | | X | | | | | |
| <i>Dryopteris arguta</i> | coast wood fern | Dryopteridaceae | | | X | | | | X | X |
| <i>Equisetum</i> sp. | common horsetail | Equisetaceae | | | | X | | | | |
| <i>Equisetum telmateia</i> ssp. <i>braunii</i> | giant horsetail | Equisetaceae | | | | X | | | X | X |
| <i>Pentagramma triangularis</i> | gold-back fern | Pteridaceae | | | X | X | X | | | X |
| <i>Polypodium calirhiza</i> | licorice fern | Polypodiaceae | | | | X | | | | |
| <i>Polypodium glycyrrhiza</i> | licorice fern | Polypodiaceae | | | X | | | | | |
| <i>Polypodium</i> sp. | polypody fern | Polypodiaceae | | | X | | | | X | |
| <i>Polystichum imbricans</i> ssp. <i>imbricans</i> | narrow-leaved sword fern | Dryopteridaceae | | | X | | X | | | |
| <i>Polystichum munitum</i> | western sword fern | Dryopteridaceae | | X | X | X | | X | X | X |
| <i>Polystichum</i> sp. | Sword fern | Dryopteridaceae | | X | | X | X | | | |
| <i>Pteridium aquilinum</i> var. <i>pubescens</i> | bracken fern | Dennstaedtiaceae | | X | X | X | X | X | X | X |
| <i>Selaginella wallacei</i> | Wallace's spikemoss | Selaginellaceae | | X | X | | X | | | |
| <i>Woodwardia fimbriata</i> | giant chainfern | Blechnaceae | | X | X | X | X | | | |
| Herbaceous Plants: Dicots | | | | | | | | | | |
| <i>Achillea millefolium</i> | yarrow | Asteraceae | | X | X | X | | X | | |
| <i>Achlys californica</i> | deer's foot | Berberidaceae | | | X | | X | X | | |
| <i>Actaea rubra</i> | baneberry | Ranunculaceae | X | | | | | X | | |
| <i>Adenocaulon bicolor</i> | trail plant | Asteraceae | | | X | | | | | |
| <i>Agoseris</i> sp. | mtn. dandelion | Asteraceae | | | X | | | | | |
| <i>Allotropa virgata</i> | sugar stick | Ericaceae | | | | | X | X | | |
| <i>Anagallis arvensis</i> | scarlet pimpernel | Primulaceae | | X | | | | | | |
| <i>Anaphalis margaritacea</i> | pearly everlasting | Asteraceae | | X | X | X | X | X | X | X |
| <i>Antirrhinum</i> sp. | snapdragon | Scrophulariaceae | | | | | X | | | |
| <i>Apocynum androsaemifolium</i> | dogbane | Apocynaceae | | | X | | | X | X | |
| <i>Aralia californica</i> | elk clover | Araliaceae | | | X | | | | | |
| <i>Arnica discoidea</i> | rayless arnica | Asteraceae | | | X | | | X | | |
| <i>Artemisia douglasiana</i> | mugwort | Asteraceae | | | | | X | | | X |
| <i>Aruncus dioicus</i> var. <i>pubescens</i> | hairy goatsbeard | Rosaceae | | | X | X | X | | | |
| <i>Asarum hartwegii</i> | creeping wild ginger | Aristolochiaceae | | | | | | | X | |
| <i>Aster [Eurybia] radulinus</i> | roughleaf aster | Asteraceae | | | X | X | | | | |
| <i>Aster [Sericarpus] oregonensis</i> | Oregon whitetop aster | Asteraceae | | | X | | X | | | |
| <i>Aster [Symphyotrichum] chilensis</i> | California aster | Asteraceae | X | | | | | | | |
| <i>Bellis perennis</i> * | English daisy | Asteraceae | | | | X | | | | X |
| <i>Bidens</i> sp. | beggar's tickweed | Asteraceae | | X | | | | | | |
| <i>Boschniakia strobilacea</i> | California groundcone | Orobanchaceae | | | X | | X | X | | |
| <i>Boykinia occidentalis</i> | western boykinia | Saxifragaceae | | | X | | X | | | |
| <i>Brassica nigra</i> * | black mustard | Brassicaceae | | X | | X | | | | |
| <i>Brassica</i> sp. | wild mustard | Brassicaceae | X | | | | | | | |
| <i>Cacaliopsis nardosmia</i> | silvercrown | Asteraceae | | | X | | | | | |
| <i>Calypso bulbosa</i> | fairy slipper orchid | Orchidaceae | | | X | | | X | | |

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|---|----------------------------------|------------------|---------------|--------|--------|--------|-------------|-------------------|--------|--------|
| | | | All | Loc. 1 | Loc. 2 | Loc. 3 | | | | |
| <i>Calystegia occidentalis</i> ssp. <i>occidentalis</i> | western morning glory | Convolvulaceae | | X | X | | | X | | |
| <i>Campanula scouleri</i> | Scouler's bluebell | Campanulaceae | | | X | | | X | | |
| <i>Campanula</i> sp. | bluebell | Campanulaceae | | | | | X | | | |
| <i>Capsella bursa-pastoris</i> * | shepherd's-purse | Brassicaceae | X | | | | | | | |
| <i>Cardamine californica</i> | California toothwort | Brassicaceae | | | X | | | X | X | X |
| <i>Cardamine nuttallii</i> var. <i>gemmata</i> | yellow-tubered toothwort | Brassicaceae | | X | X | X | | | | |
| <i>Cardamine oligosperma</i> | few-seed bitter-cress | Brassicaceae | | | | X | | | | X |
| <i>Cardaria draba</i> * | hoary cress | Brassicaceae | | | X | | | | | |
| <i>Castilleja affinis</i> ssp. <i>affinis</i> | coast paintbrush | Scrophulariaceae | | X | X | | X | | | |
| <i>Centaurea solstitialis</i> * | yellow star-thistle | Asteraceae | | | X | | | | | |
| <i>Centaurea maculosa</i> | spotted knapweed | Asteraceae | | X | X | | | X | | |
| <i>Centaureum erythraea</i> * | common centaurium | Gentianaceae | | | X | | | | | |
| <i>Centaureum muehlenbergii</i> | Monterey centaurium | Gentianaceae | | X | | X | | | | |
| <i>Cerastium arvense</i> | meadow chickweed | Caryophyllaceae | | | X | | X | | | |
| <i>Cerastium glomeratum</i> * | chickweed | Caryophyllaceae | | | X | X | X | | | X |
| <i>Chamaesyce</i> sp. | spurge | Euphorbiaceae | | | | | | | | X |
| <i>Chamomilla suaveolens</i> [<i>Matricaria matricarioides</i>] * | pineapple weed | Asteraceae | | | X | | | | | |
| <i>Chimaphila menziesii</i> | little prince's pine, pipsissewa | Ericaceae | | | X | | | X | | |
| <i>Cichorium intybus</i> * | chicory | Asteraceae | | X | X | X | X | X | | |
| <i>Cirsium vulgare</i> * | bull thistle | Asteraceae | | | X | X | | | X | X |
| <i>Claytonia perfoliata</i> | miner's lettuce | Portulacaceae | | | X | | | | X | X |
| <i>Claytonia sibirica</i> | candy flower | Portulacaceae | | | X | X | | | X | X |
| <i>Collinsia parviflora</i> | small flowered collinsia | Scrophulariaceae | | | X | | X | | | |
| <i>Collomia heterophylla</i> | variableleaf collomia | Polemoniaceae | | | X | | X | X | | |
| <i>Conium maculatum</i> * | poison hemlock | Apiaceae | | | | | | | X | X |
| <i>Conyza canadensis</i> * | sneezeweed | Asteraceae | | X | | | X | | | |
| <i>Corallorhiza</i> sp. | coralroot | Orchidaceae | | | X | | X | | | |
| <i>Crepis</i> sp. | hawksbeard | Asteraceae | X | | | | | | | |
| <i>Cryptantha</i> cf. <i>muricata</i> | prickly popcornflower | Boraginaceae | | | X | | | | | |
| <i>Cypripedium californicum</i> | California lady's slipper | Orchidaceae | | X | | | X | | | |
| <i>Darlingtonia californica</i> | California pitcherplant | Sarraceniaceae | | X | | | | | | |
| <i>Daucus carota</i> * | Queen Anne's lace | Apiaceae | | X | X | X | X | X | X | X |
| <i>Delphinium</i> cf. <i>hesperium</i> | western larkspur | Ranunculaceae | | X | | | | | | |
| <i>Delphinium nudicaule</i> | red larkspur | Ranunculaceae | | | X | | X | | | |
| <i>Delphinium</i> sp. | larkspur | Ranunculaceae | | X | | | | | | |
| <i>Dianthus armeria</i> ssp. <i>armeria</i> * | Deptford pink | Caryophyllaceae | | | | X | | | | |
| <i>Digitalis purpurea</i> * | foxglove | Scrophulariaceae | | | | | | | | X |
| <i>Draba verna</i> | Spring draba | Brassicaceae | | | X | | | | | |
| <i>Epilobium</i> [<i>Boisduvalia</i>] sp. | willowherb | Onagraceae | | | | | X | | | |
| <i>Epilobium angustifolium</i> ssp. <i>circumvagum</i> | fireweed | Onagraceae | | | X | | | | | X |
| <i>Epilobium canum</i> ssp. <i>latifolium</i> | California fuchsia | Onagraceae | | | X | | X | X | | |
| <i>Epilobium ciliatum</i> ssp. <i>ciliatum</i> | hairy willowherb | Onagraceae | | X | | X | | | | |
| <i>Epilobium foliosum</i> | California willowherb | Onagraceae | | | | | X | | | |
| <i>Epilobium</i> sp. | willowherb | Onagraceae | | X | X | | X | | X | |

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|---|-----------------------------|---------------------------|---------------|--------|--------|--------|-------------|-------------------|--------|--------|
| | | | All | Loc. 1 | Loc. 2 | Loc. 3 | | | | |
| <i>Epipactis gigantea</i> | stream orchid | Orchidaceae | | x | | | | | | |
| <i>Erechtites minima</i> * | fireweed | Asteraceae | | | | | | | x | |
| <i>Erigeron cervinus</i> | Siskiyou daisy | Asteraceae | | | x | | | | | |
| <i>Erigeron foliosus</i> var. <i>confinis</i> | leafy fleabane | Asteraceae | | | | x | | | | |
| <i>Eriogonum compositum</i> | arrow-leaved buckwheat | Polygonaceae | | | x | | x | | | |
| <i>Eriogonum nudum</i> var. <i>nudum</i> | naked buckwheat | Polygonaceae | | x | x | x | x | x | | |
| <i>Eriophyllum lanatum</i> var. <i>achilleoides</i> | woolly sunflower | Asteraceae | | x | x | x | x | x | | |
| <i>Erodium cicutarium</i> * | redstem filaree | Geraniaceae | | | | | x | x | | |
| <i>Erodium</i> sp. | filaree/stork's bill | Geraniaceae | x | | | | | | | |
| <i>Erysimum capitatum</i> ssp. <i>capitatum</i> | western wallflower | Brassicaceae | | x | x | | x | x | | |
| <i>Eschscholzia californica</i> | California poppy | Papaveraceae | x | | | | | | x | |
| <i>Euphorbia peplus</i> * | petty spurge | Euphorbiaceae | | | | | | | x | |
| <i>Filago gallica</i> | filago | Asteraceae | | x | | | | | | |
| <i>Foeniculum vulgare</i> * | common fennel | Apiaceae | | | | | x | | | |
| <i>Fragaria vesca</i> | wood strawberry | Rosaceae | | | x | x | | | x | |
| <i>Galium andrewsii</i> | bedstraw | Rubiaceae | | | x | | x | | | |
| <i>Galium aparine</i> * | common bedstraw | Rubiaceae | | | | x | x | | x | |
| <i>Galium bolanderi</i> | Bolander's bedstraw | Rubiaceae | | | x | | | | | |
| <i>Galium parisiense</i> * | wall bedstraw | Rubiaceae | | | | x | | x | | |
| <i>Galium</i> sp. | bedstraw | Rubiaceae | | | x | | x | | | |
| <i>Gayophytum</i> sp. | groundsmoke | Onagraceae | | | x | | | | | |
| <i>Gentianella amarella</i> ssp. <i>acuta</i> | gentian | Gentianaceae | | | | | x | | | |
| <i>Geranium dissectum</i> * | cut-leaved geranium | Geraniaceae | x | | | | | | x | |
| <i>Geranium pusillum</i> * | small geranium | Geraniaceae | | | | | | x | | |
| <i>Gilia capitata</i> ssp. <i>capitata</i> | bluehead gilia | Polemoniaceae | | x | | | | | | |
| <i>Gilia</i> sp. | gilia | Polemoniaceae | | | | | x | | | |
| <i>Goodyera oblongifolia</i> | rattlesnake plantain | Orchidaceae | x | | | | | x | | |
| <i>Hedera helix</i> * | English ivy | Araliaceae | | | | | | x | x | |
| <i>Herniaria hirsuta</i> ssp. <i>hirsuta</i> * | hairy rupturewort | Caryophyllaceae | x | | | | | | | |
| <i>Heuchera micrantha</i> | alumroot | Saxifragaceae | | | x | | x | | | |
| <i>Hieracium albiflorum</i> | white hawkweed | Asteraceae | | | x | | x | | x | |
| <i>Hirschfeldia incana</i> * | Mediterranean hoary mustard | Brassicaceae | x | x | | | | | | |
| <i>Hydrophyllum occidentale</i> | western waterleaf | Hydrophyllaceae | | | | | | x | x | |
| <i>Hydrophyllum</i> sp. | waterleaf | Hydrophyllaceae | | | | | x | | | |
| <i>Hypericum perforatum</i> * | Klamathweed | Hypericaceae [Clusiaceae] | | x | x | x | x | x | | |
| <i>Hypochaeris radicata</i> * | rough cat's ear | Asteraceae | | x | x | x | x | x | x | |
| <i>Kickxia elatine</i> * | sharpsleaved fluellin | Scrophulariaceae | | x | x | | x | x | | |
| <i>Lactuca saligna</i> * | prickly lettuce | Asteraceae | | x | | | | | | |
| <i>Lactuca serriola</i> * | prickly lettuce | Asteraceae | | x | | x | x | | | |
| <i>Lamium purpureum</i> * | henbit | Lamiaceae | | | x | | | | | |
| <i>Lapsana communis</i> * | common nipplewort | Asteraceae | | | x | x | | | x | |
| <i>Lathyrus delnorticus</i> | Del Norte pea | Fabaceae | | | | x | | | | |
| <i>Lathyrus latifolius</i> * | perennial sweet pea | Fabaceae | | x | | | | | | |
| <i>Lathyrus polyphyllus</i> | leafy pea | Fabaceae | | | | | x | | | |

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| <i>Lathyrus</i> sp. | wild pea | Fabaceae | | | | | x | | | |
| <i>Lathyrus vestitus</i> | Pacific pea | Fabaceae | x | | | x | | x | | |
| <i>Lepidium latifolium</i> | broad-leaved peppergrass | Brassicaceae | x | | | | | | | |
| <i>Lepidium</i> sp. | peppergrass | Brassicaceae | x | | | | | | | |
| <i>Leucanthemum vulgare</i> * | ox-eye daisy | Asteraceae | x | | | | x | | x | |
| <i>Lewisia cotyledon</i> var. <i>cotyledon</i> | cliff maids | Portulacaceae | | | | | x | | | |
| <i>Ligusticum californicum</i> | California lovage | Apiaceae | | | x | | | | | |
| <i>Linnaea borealis</i> ssp. <i>longiflora</i> | twinflower | Primulaceae | | | x | | | | | |
| <i>Linum</i> sp. | flax | Linaceae | | | | | | | x | |
| <i>Lomatium californicum</i> | California lomatium | Apiaceae | | | | 25.15 | | | | |
| <i>Lomatium howellii</i> | Howell's lomatium | Apiaceae | | x | | | | | | |
| <i>Lomatium macrocarpum</i> | large fruited lomatium | Apiaceae | x | | | | | | | |
| <i>Lomatium martindalei</i> | Coast Range lomatium | Apiaceae | | | x | | | | | |
| <i>Lomatium vaginatum</i> | sheathed lomatium | Apiaceae | | | x | | | | | |
| <i>Lonicera hispidula</i> var. <i>vacillans</i> | hairy honeysuckle | Caprifoliaceae | | | x | | x | x | | |
| <i>Lotus corniculatus</i> * | birdfoot trefoil | Fabaceae | | x | x | x | | x | x | |
| <i>Lotus crassifolius</i> var. <i>crassifolius</i> | buck lotus, big deervetch | Fabaceae | | | | | | x | | |
| <i>Lotus micranthus</i> | small-flowered lotus | Fabaceae | | x | | | x | x | | |
| <i>Lotus purshianus</i> | Spanish lotus | Fabaceae | | x | x | x | | x | | |
| <i>Lotus</i> sp. | lotus | Fabaceae | x | | | | x | | | |
| <i>Luina hypoleuca</i> | littleleaf silverback | Asteraceae | | | x | | x | x | | |
| <i>Lupinus bicolor</i> | miniature lupine | Fabaceae | | | x | | x | x | | |
| <i>Lupinus latifolius</i> | broadleaf lupine | Fabaceae | | | | | | x | | |
| <i>Lupinus rivularis</i> | riverbank upine | Fabaceae | | x | | | | | | |
| <i>Lupinus</i> sp. | lupine | Fabaceae | | | | x | x | | | |
| <i>Lythrum hyssopifolia</i> * | hyssop loosestrife | Lythraceae | | | | | | | x | |
| <i>Madia gracilis</i> | slender tarweed | Asteraceae | | | x | | | | | |
| <i>Madia madioides</i> | woodland madia | Asteraceae | | | x | | | | | |
| <i>Madia</i> sp. | madia | Asteraceae | | | | | | | x | |
| <i>Marah oregonus</i> | coast manroot | Cucurbitaceae | | | | | | x | x | |
| <i>Medicago polymorpha</i> * | bur-clover | Fabaceae | | | | | | x | x | |
| <i>Medicago sativa</i> * | alfalfa | Fabaceae | | x | | | | | | |
| <i>Medicago</i> sp. * | bur-clover | Fabaceae | x | | | | | | | |
| <i>Melilotus alba</i> * | white sweetclover | Fabaceae | | x | | | | x | x | |
| <i>Melilotus</i> sp. * | sweetclover | Fabaceae | | | x | | | | | |
| <i>Mentha pulegium</i> * | pennyroyal | Lamiaceae | | | x | | x | | | |
| <i>Mentha spicata</i> var. <i>spicata</i> * | spearmint | Lamiaceae | | | | x | | | | |
| <i>Microseris laciniata/nutans</i> | microseris | Asteraceae | | | x | | | | | |
| <i>Mimulus alsinoides</i> | chickweed monkeyflower | Scrophulariaceae | | | | | x | | | |
| <i>Mimulus guttatus</i> | seep monkeyflower | Scrophulariaceae | x | | | | x | | | |
| <i>Mimulus</i> sp. | monkeyflower | Scrophulariaceae | | | x | | x | | | |
| <i>Minuartia douglasii</i> | Douglas sandwort | Caryophyllaceae | | | x | | | | | |
| <i>Montia parvifolia</i> | showy rock montia | Portulacaceae | | | x | | x | | | |
| <i>Montia</i> sp. | miner's lettuce | Portulacaceae | x | | | | x | | | |

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| <i>Myosotis discolor</i> * | yellow-&-blue forget-me-not | Boraginaceae | x | | | | | | | |
| <i>Navarretia divaricata</i> ssp. <i>divaricata</i> | mountain navarretia | Polemoniaceae | | | | | x | | | |
| <i>Navarretia</i> sp. (no flowers) | navarretia | Polemoniaceae | | | | | x | x | | |
| <i>Navarretia squarrosa</i> | skunkweed | Polemoniaceae | | | | | x | | | |
| <i>Nemophila menziesii</i> | baby blue eyes | Hydrophyllaceae | x | | | | | | | |
| <i>Nemophila</i> sp. | baby blue eyes | Hydrophyllaceae | | | x | x | | | | |
| <i>Oenanthe sarmentosa</i> | water dropwort | Apiaceae | | | | | | | | x |
| <i>Osmorhiza purpurea</i> | purple sweet-cicely | Apiaceae | x | | | | | | | |
| <i>Osmorhiza chilensis</i> [O. <i>berteroi</i>] | mountain sweet-cicely | Apiaceae | | | x | x | | | | x |
| <i>Oxalis oregona</i> | redwood sorrel | Oxalidaceae | | x | x | | | | x | x |
| <i>Oxalis</i> sp. * | sorrel | Oxalidaceae | | | | | | | x | |
| <i>Pedicularis</i> sp. | Indian warrior | Scrophulariaceae | x | | | | x | | | |
| <i>Pedicularis densiflora</i> | Indian warrior | Scrophulariaceae | x | | | | | | | |
| <i>Penstemon</i> cf. | penstemon | Scrophulariaceae | | | | | x | | | |
| <i>Petasites frigidus</i> var. <i>palmatus</i> | sweet coltsfoot | Asteraceae | | | x | | | | x | |
| <i>Petrorhagia dubia</i> * | grass pink | Caryophyllaceae | | x | | | | | | |
| <i>Phacelia</i> cf. <i>bolanderi</i> | phacelia | Hydrophyllaceae | | x | | | | | | |
| <i>Phacelia</i> cf. <i>hastata</i> | silverleaf phacelia | Hydrophyllaceae | | | | | x | x | | |
| <i>Phacelia corymbosa</i> | serpentine phacelia | Hydrophyllaceae | | x | | | | | | |
| <i>Phacelia heterophylla</i> ssp. <i>virgata</i> | varied leaf phacelia | Hydrophyllaceae | | x | | | | | | |
| <i>Phlox gracilis</i> | slender phlox | Polemoniaceae | | | x | | x | | | |
| <i>Phlox speciosa</i> ssp. <i>occidentalis</i> | showy phlox | Polemoniaceae | | | x | | | | | |
| <i>Pinguicula macroceras</i> | horned butterwort | Orobanchaceae | | x | | | | | | |
| <i>Plagiobothrys</i> sp. | popcornflower | Boraginaceae | x | | | | | | | |
| <i>Plantago elongata</i> | slender plantain | Plantaginaceae | | | | | x | x | | |
| <i>Plantago eriopoda</i> | saline plantain | Plantaginaceae | | | | x | | | | |
| <i>Plantago lanceolata</i> * | English plantain | Plantaginaceae | | x | x | x | x | x | | x |
| <i>Plantago major</i> * | common plantain | Plantaginaceae | | | x | | x | x | x | |
| <i>Plantago</i> sp. | plantain | Plantaginaceae | | | | | x | | | |
| <i>Polygala californica</i> | California milkwort | Polygalaceae | | x | x | | x | x | | |
| <i>Polygonum arenastrum</i> [P. <i>aviculare</i>] | common knotweed | Polygonaceae | | | x | | | | x | |
| <i>Polygonum douglasii</i> ssp. <i>spergulariiforme</i> | Douglas knotweed | Polygonaceae | | | | | x | | | |
| <i>Potentilla glandulosa</i> ssp. <i>globosa</i> | common cinquefoil | Rosaceae | | | x | | | | | |
| <i>Prunella vulgaris</i> ssp. <i>lanceolata</i> | self-heal | Lamiaceae | | | x | x | | | | x |
| <i>Pyrola picta</i> | white-veined wintergreen | Ericaceae | | | x | | | x | | |
| <i>Ranunculus repens</i> * | buttercup | Ranunculaceae | | | | x | | | x | x |
| <i>Romanzoffia californica</i> | California mistmaiden | Hydrophyllaceae | | | x | | | | | |
| <i>Rumex acetosella</i> * | sheep sorrel | Polygonaceae | | x | | | | x | | x |
| <i>Rumex crispus</i> * | curly dock | Polygonaceae | | | x | x | x | | x | x |
| <i>Sagina decumbens</i> ssp. <i>occidentalis</i> | western pearlwort | Caryophyllaceae | | | x | x | | | | |
| <i>Sanguisorba minor</i> ssp. <i>muricata</i> * | garden burnet | Rosaceae | | x | | x | x | x | | |
| <i>Sanicula crassicaulis</i> | Pacific snakeroot | Apiaceae | | | x | x | | | | x |
| <i>Satureja douglasii</i> | yerba buena | Lamiaceae | | | x | | | | | |
| <i>Saxifraga howellii</i> | Howell's saxifrage | Saxifragaceae | | x | | | | | | |

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| <i>Saxifraga mertensiana</i> | wood saxifrage | Saxifragaceae | | | x | | | | | |
| <i>Scrophularia californica</i> | California bee plant | Scrophulariaceae | | x | | | | x | x | |
| <i>Scutellaria antirrhinoides</i> | snapdragon skullcap | Scrophulariaceae | | x | | | x | | | |
| <i>Sedum laxum</i> ssp. <i>laxum</i> | roseflower stonecrop | Crassulaceae | | | x | | | | | |
| <i>Sedum spathulifolium</i> | broadleaf stonecrop | Crassulaceae | | x | x | | x | x | | |
| <i>Sedum</i> sp. | stoncrop | Crassulaceae | | | | | x | | | |
| <i>Senecio vulgaris</i> * | common groundsel | Asteraceae | | | | | | | x | |
| <i>Soliva sessilis</i> * | lawn burrweed | Asteraceae | | | x | | | | | |
| <i>Sonchus asper</i> ssp. <i>asper</i> * | prickly sowthistle | Asteraceae | | | | x | | x | x | |
| <i>Sonchus oleraceus</i> * | common sowthistle | Asteraceae | | | x | | | | x | |
| <i>Sonchus</i> sp. | Sow thistle | Asteraceae | | | | | | | | |
| <i>Spergula</i> sp. | spurry | Caryophyllaceae | | | | | x | | | |
| <i>Spergularia rubra</i> * | purple sand-spurrey | Caryophyllaceae | | x | | | | | | |
| <i>Stachys ajugoides</i> var. <i>rigida</i> | hedge nettle | Lamiaceae | | x | | x | | x | x | |
| <i>Stellaria media</i> * | common chickweed | Caryophyllaceae | x | | | | | | | |
| <i>Stellaria nitens</i> | shining chickweed | Caryophyllaceae | | | x | | | | | |
| <i>Synthyris reniformis</i> | snow queen | Scrophulariaceae | | | x | | | | | |
| <i>Taraxacum officinale</i> * | dandelion | Asteraceae | | | x | x | x | | x | |
| <i>Tellima grandiflora</i> | fringe cups | Saxifragaceae | | | | | | | x | |
| <i>Thalictrum occidentale</i> | western meadow rue | Ranunculaceae | | | | | x | | | |
| <i>Thermopsis gracilis</i> var. <i>gracilis</i> | slender false lupine | Fabaceae | | | | | | x | | |
| <i>Thlaspi</i> sp. | pennycress | Brassicaceae | x | | | | | | | |
| <i>Thysanocarpus curvipes</i> | common fringe pod | Brassicaceae | | | x | | x | x | | |
| <i>Tolmiea menziesii</i> | piggy-back plant | Saxifragaceae | | | x | | | | x | |
| <i>Tonella tenella</i> | small-flowered tonella | Scrophulariaceae | | | x | | | | | |
| <i>Torilis arvensis</i> * | hedge parsley | Apiaceae | | | | x | | x | x | |
| <i>Trientalis latifolius</i> | Pacific star-flower | Primulaceae | | | x | | x | x | x | |
| <i>Trifolium arvense</i> * | rabbitfoot clover | Fabaceae | | x | | | x | | | |
| <i>Trifolium cyathiferum</i> | bowl clover | Fabaceae | | | x | | | | | |
| <i>Trifolium dubium</i> * | suckling clover | Fabaceae | | x | x | x | x | | | |
| <i>Trifolium hirtum</i> * | rose clover | Fabaceae | | x | x | x | x | | | |
| <i>Trifolium oliganthum</i> | few-flowered clover | Fabaceae | | | x | | | | | |
| <i>Trifolium pratense</i> * | red clover | Fabaceae | | x | x | x | x | x | x | |
| <i>Trifolium repens</i> * | white clover | Fabaceae | | x | x | x | x | x | x | |
| <i>Trifolium</i> sp. | clover | Fabaceae | x | | | | | | | |
| <i>Trifolium subterraneum</i> * | subterranean clover | Fabaceae | x | | | | | | | |
| <i>Trifolium willdenovii</i> | tomcat clover | Fabaceae | | | x | | x | | | |
| <i>Urtica dioica</i> | stinging nettle | Urticaceae | | | | | | x | x | |
| <i>Valeriana sitchensis</i> ssp. <i>scouleri</i> | Sitka valerian | Valerianaceae | | x | x | | | | | |
| <i>Vancouveria hexandra</i> | inside-out flower | Berberidaceae | | | x | | x | x | x | |
| <i>Vancouveria planipetala</i> | inside-out flower | Berberidaceae | | x | x | | x | | | |
| <i>Verbascum thapsus</i> * | common mullein | Scrophulariaceae | | x | | | | | | |
| <i>Veronica</i> cf. <i>americana</i> | American speedwell | Scrophulariaceae | x | | | | | | | |
| <i>Veronica serpyllifolia</i> ssp. <i>serpyllifolia</i> | thyme-leaved speedwell | Scrophulariaceae | | | x | | | | x | |

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| Scientific Name (* = non-native species) | Common Name | Family | Patrick Creek | | | | The Narrows | Washing-ton Curve | Ruby 1 | Ruby 2 |
|---|---------------------------|---------------------------------|---------------|--------|--------|--------|-------------|-------------------|--------|--------|
| | | | All | Loc. 1 | Loc. 2 | Loc. 3 | | | | |
| <i>Vicia gigantea</i> | giant vetch | Fabaceae | | | | | | | | X |
| <i>Vicia hirsuta</i> * | tiny vetch | Fabaceae | | | | | | | X | |
| <i>Vicia sativa</i> * | spring vetch | Fabaceae | | | | X | X | | X | X |
| <i>Vicia</i> sp. 1 | vetch | Fabaceae | | X | | | X | | | |
| <i>Vicia</i> sp. 2 | vetch | Fabaceae | X | | | | | | | |
| <i>Vinca major</i> * | periwinkle | Apocynaceae | | | | | | | X | X |
| <i>Viola sempervirens</i> | evergreen violet | Violaceae | | | X | | | X | X | |
| <i>Viola</i> sp. 1 | violet | Violaceae | X | | | | | | | |
| <i>Viola</i> sp. 2 | violet | Violaceae | X | | | | | | | |
| <i>Whipplea modesta</i> | yerba de selva | Philadelphaceae [Hydrangeaceae] | | X | X | X | X | X | | |
| Herbaceous Plants: Monocots | | | | | | | | | | |
| <i>Achnatherum lemmonii</i> | Lemmon's needlegrass | Poaceae | | | X | | | | | |
| <i>Agrostis</i> sp. | bent grass | Poaceae | | X | X | X | X | X | X | |
| <i>Agrostis hallii</i> | Hall's bentgrass | Poaceae | | | X | | | | | |
| <i>Agrostis stolonifera</i> | creeping bent | Poaceae | | X | | X | | | | |
| <i>Aira caryophyllea</i> * | silver European hairgrass | Poaceae | | X | X | X | X | X | | X |
| <i>Aira praecox</i> * | yellow hairgrass | Poaceae | | | | | X | X | | |
| <i>Allium amplexans</i> | narrowleaf onion | Liliaceae | | | | | X | | | |
| <i>Anthoxanthum odoratum</i> * | sweet vernal grass | Poaceae | | X | | X | | X | X | X |
| <i>Avena barbata</i> * | slender wild oat | Poaceae | | X | X | X | | X | | |
| <i>Avena fatua</i> * | wild oat | Poaceae | | | | X | | | | |
| <i>Avena</i> sp. * | wild oat | Poaceae | | | | | X | | | X |
| <i>Briza maxima</i> * | quaking grass | Poaceae | | X | X | X | X | X | | X |
| <i>Bromus carinatus</i> | California brome | Poaceae | | | | | | | | X |
| <i>Bromus diandrus</i> * | ripgut brome | Poaceae | | X | X | X | X | X | X | X |
| <i>Bromus hordeaceus</i> * | soft chess | Poaceae | | X | X | X | | X | | X |
| <i>Bromus laevipes</i> | chinook brome | Poaceae | | | | X | | X | | |
| <i>Bromus madritensis</i> ssp. <i>rubens</i> * | red brome | Poaceae | | | | X | | X | | |
| <i>Bromus</i> sp. | brome | Poaceae | X | | | | X | | | |
| <i>Bromus tectorum</i> * | cheatgrass | Poaceae | | | | X | | | | X |
| <i>Calochortus amabilis</i> | golden globelily | Liliaceae | | | | | X | | | |
| <i>Calochortus</i> sp. | mariposa lily | Liliaceae | | | X | | | | | |
| <i>Carex bolanderi</i> | Bolander's sedge | Cyperaceae | X | | | | | | | |
| <i>Carex harfordii</i> | Harford's sedge | Cyperaceae | X | | | | | | | |
| <i>Carex mendocinoensis</i> | Mendocino sedge | Cyperaceae | | X | | | | | | |
| <i>Carex mendocinoensis</i> x <i>C. gynodynamis</i> | carex hybrid | Cyperaceae | X | | | | | | | |
| <i>Carex multicaulis</i> | forest sedge | Cyperaceae | | | | | | X | | |
| <i>Carex nudata</i> | torrent sedge | Cyperaceae | | | X | | | | X | |
| <i>Carex obnupta</i> | slough sedge | Cyperaceae | | | | | | | X | |
| <i>Carex rossii</i> | sedge | Cyperaceae | | | X | | | | | |
| <i>Carex</i> sp. | nutsedge | Cyperaceae | | | X | X | X | | X | |
| <i>Chlorogalum pomeridianum</i> ssp. <i>p.</i> | wavyleaf soaproot | Liliaceae | | | | | X | | | |
| <i>Cortaderia jubata</i> * | pampas grass | Poaceae | X | | | | | | | |

Appendix N. Plant Species Observed in the Study Area.

Compiled from ICF Jones Stokes and Caltrans surveys; nomenclature follows *The Jepson Manual* (Hickman 1993) and online updates.

| Scientific Name (* = non-native species) | Common Name | Family | Patrick Creek | | | | The Narrows | Washing-ton Curve | Ruby 1 | Ruby 2 |
|--|--------------------------|------------|---------------|--------|--------|--------|-------------|-------------------|--------|--------|
| | | | All | Loc. 1 | Loc. 2 | Loc. 3 | | | | |
| <i>Cortaderia selloana</i> * | pampas grass | Poaceae | | | | | | | | X |
| <i>Cynodon dactylon</i> * | Bermuda grass | Poaceae | | X | | X | X | | | |
| <i>Cynosurus echinatus</i> * | hedghehog dog-tail grass | Poaceae | | X | X | X | X | X | X | |
| <i>Cyperus eragrostis</i> | umbrella sedge | Cyperaceae | | X | | X | X | | X | X |
| <i>Dactylis glomerata</i> * | orchard grass | Poaceae | | | X | X | X | X | X | X |
| <i>Deschampsia</i> sp. | hairgrass | Poaceae | X | | | | | | | |
| <i>Dichelostemma capitatum</i> ssp. <i>capitatum</i> | blue dicks | Liliaceae | | | X | | | X | | |
| <i>Disporum hookeri</i> | Hooker's fairy bells | Liliaceae | X | | X | | | | | |
| <i>Disporum smithii</i> | coast fairy bells | Liliaceae | X | | | X | | | X | X |
| <i>Echinochloa crus-galli</i> * | barnyard grass | Poaceae | | X | | | | | | |
| <i>Eleocharis macrostachya</i> | common spikerush | Cyperaceae | | X | | | X | | | |
| <i>Eleocharis pachycarpa</i> * | black sand spikerush | Cyperaceae | | | | | X | | | |
| <i>Elymus elymoides</i> | squirrel-tail grass | Poaceae | | | | | | | X | |
| <i>Elymus glaucus</i> ssp. <i>glaucus</i> . | blue wildrye | Poaceae | | X | X | | X | X | | X |
| <i>Festuca arundinacea</i> * | tall fescue | Poaceae | | X | X | X | X | X | | X |
| <i>Festuca californica</i> ssp. <i>californica</i> | California fescue | Poaceae | | X | X | | | | | |
| <i>Festuca idahoensis</i> | Idaho fescue | Poaceae | | | X | | | X | | |
| <i>Festuca rubra</i> | red fescue | Poaceae | | | | | X | | | |
| <i>Festuca</i> sp. | fescue | Poaceae | | X | X | | X | X | | X |
| <i>Fritillaria affinis</i> var. <i>affinis</i> | checker lily | Liliaceae | | | X | | X | | | |
| <i>Gastridium ventricosum</i> | nitgrass | Poaceae | | X | | | X | | | |
| <i>Glyceria elata</i> | tall manna grass | Poaceae | | | | | | | | X |
| <i>Glyceria occidentalis</i> | manna grass | Poaceae | | | | | | | | X |
| <i>Hierochloa occidentalis</i> | vanilla grass | Poaceae | X | | | | | X | | |
| <i>Holcus lanatus</i> * | common velvet grass | Poaceae | | | X | X | X | X | X | |
| <i>Hordeum marinum</i> ssp. <i>gussoneanum</i> * | Mediterranean barley | Poaceae | | X | | | | X | | |
| <i>Hordeum</i> sp. | wild barley | Poaceae | X | | | | | | | |
| <i>Iris</i> cf. <i>hartwegii</i> | Hartweg's iris | Iridaceae | | | | | X | | | |
| <i>Iris douglasiana</i> | Douglas iris | Iridaceae | | | X | | | | | |
| <i>Iris bracteata</i> | Siskiyou iris | Iridaceae | X | X | X | X | X | X | | |
| <i>Juncus balticus</i> | Baltic rush | Juncaceae | | | X | | | | | |
| <i>Juncus bolanderi</i> | Bolander's rush | Juncaceae | | X | | X | X | X | | |
| <i>Juncus bufonius</i> | toad rush | Juncaceae | | X | | | | X | | |
| <i>Juncus effusus</i> | soft rush | Juncaceae | | | X | X | X | | | X |
| <i>Juncus ensifolius</i> | three-stemmed rush | Juncaceae | | X | | X | | | | |
| <i>Juncus</i> sp. | rush | Juncaceae | | | | X | X | | | |
| <i>Kniphofia uvaria</i> * | redhot poker | Liliaceae | | | | | | | X | |
| <i>Lolium multiflorum</i> * | Italian ryegrass | Poaceae | | | | | X | | | |
| <i>Luzula comosa</i> | hairy woodrush | Juncaceae | | | X | | | | | |
| <i>Lysichiton americanus</i> | yellow skunk cabbage | Araceae | | | | | | | | X |
| <i>Maianthemum dilatatum</i> | false lily of the valley | Liliaceae | | | | | | | X | |
| <i>Melica bulbosa</i> | oniongrass | Poaceae | X | | | | X | | | |
| <i>Melica harfordii</i> | Harford's melic | Poaceae | | | | | X | | | |
| <i>Melica</i> sp. | melic | Poaceae | | | X | | X | X | | |

Appendix N. Plant Species Observed in the Study Area.

Compiled from ICF Jones Stokes and Caltrans surveys; nomenclature follows *The Jepson Manual* (Hickman 1993) and online updates.

| Scientific Name (* = non-native species) | Common Name | Family | Patrick Creek | | | | The Narrows | Washing-ton Curve | Ruby 1 | Ruby 2 |
|--|----------------------------|-------------|---------------|------------|------------|------------|-------------|-------------------|-----------|------------|
| | | | All | Loc. 1 | Loc. 2 | Loc. 3 | | | | |
| <i>Panicum capillare</i> | panic grass | Poaceae | | X | | X | | | | |
| <i>Phalaris aquatica</i> | canary grass | Poaceae | | | | | X | | | |
| <i>Phalaris arundinacea</i> * | reed canary grass | Poaceae | | | | | X | | | |
| <i>Phleum pratense</i> * | meadow timothy | Poaceae | | | | X | | | | |
| <i>Piperia elongata</i> | dense-flowered rein orchid | Orchidaceae | | | X | | | X | | |
| <i>Piperia transversa</i> | transverse rein orchid | Orchidaceae | | X | X | | | X | | |
| <i>Poa annua</i> * | annual bluegrass | Poaceae | | | | X | | X | | X |
| <i>Poa bulbosa</i> * | bulbous bluegrass | Poaceae | | | X | | | X | | |
| <i>Poa piperi</i> | Piper's bluegrass | Poaceae | | X | | | | X | | |
| <i>Poa pratensis</i> ssp. <i>pratensis</i> | Kentucky bluegrass | Poaceae | X | | | | | | | |
| <i>Poa trivialis</i> * | rough bluegrass | Poaceae | | | | | | | | X |
| <i>Polypogon monspeliensis</i> * | rabbitsfoot grass | Poaceae | | X | | | X | | | |
| <i>Scirpus microcarpus</i> | small-flowered bulrush | Cyperaceae | | X | | | | | X | X |
| <i>Sisyrinchium bellum</i> | blue-eyed grass | Iridaceae | | | | | X | | | |
| <i>Smilacina racemosa</i> | false Solomon's seal | Liliaceae | | | X | | | | | |
| <i>Smilacina stellata</i> | false Solomon's seal | Liliaceae | | | X | | | | | |
| <i>Triteleia bridgesii</i> | Bridges' brodiaea | Liliaceae | | X | X | | | | | |
| <i>Vulpia bromoides</i> * | foxtail fescue | Poaceae | | | X | X | | | | X |
| <i>Vulpia myuros</i> ssp. <i>myuros</i> * | rattail fescue | Poaceae | | | X | X | | X | | |
| <i>Vulpia</i> sp. | rattail fescue | Poaceae | | | | | X | | | |
| <i>Xerophyllum tenax</i> | bear grass | Liliaceae | | | | | | X | | |
| <i>Zigadenus</i> sp. | deathcamas | Liliaceae | | X | | | | | | |
| Number of taxa at site | | | | 136 | 221 | 106 | 165 | 128 | 83 | 112 |
| % of non-native taxa | | | | 32 | 23 | 49 | 30 | 19 | 37 | 40 |
| Total Number of Plant Taxa = 452 | Non-native = 23% | | | | | | | | | |

Introduction

This appendix provides the lists of special-status plants and sensitive natural communities generated by querying the California Natural Diversity Database (CNDDDB) (California Natural Diversity Database 2009), and the California Native Plant Society's (CNPS's) online *Inventory of Rare and Endangered Plants* (California Native Plant Society 2009). These databases provide information on known occurrences of state and federal listed plants, and California Rare Plant Rank (CRPR) Lists 1B, 2, and 3 plants, and were queried by USGS 7.5-minute quadrangle to generate a list of sensitive plant species with known occurrences in the project region (*region* is conventionally defined as quadrangle within which the project site is located and the surrounding nine quadrangles).

For the SR 197 project sites (Ruby 1 and Ruby 2) the Hiouchi USGS 7.5-minute quadrangle and eight surrounding quadrangles: Childs Hill, Sister Rocks, High Plateau Mountain, Gasquet, Cant Hook Mountain, High Divide, Smith River, and Crescent City were queried.

For the US 199 sites (Patrick Creek Locations 1, 2, and 3, The Narrows, and Washington Curve), the Hurdygurdy Butte and Shelly Creek Ridge quadrangles and surrounding quadrangles: Ship Mountain, Cant Hook Mountain, Broken Rib Mountain, Devils Punchbowl, Prescott Mountain, High Plateau Mountain, and Gasquet were queried.

Explanation of Columns and Codes

Federal Status

- E = listed as endangered under the federal Endangered Species Act.
- T = listed as threatened under the federal Endangered Species Act.
- = no listing.

State Status

- E = listed as endangered under the California Endangered Species Act.
- R = listed as rare under the California Native Plant Protection Act. This category is no longer used for newly listed plants, but some plants previously listed as rare retain this designation.
- = no listing.

G-Rank and S-Rank: Global and State Rank System

The CNDDDB is a "natural heritage program" and is part of a nationwide network of similar programs overseen by NatureServe (formerly part of The Nature Conservancy). The goal of the CNDDDB is to provide the most current information available on the state's most imperiled elements of natural diversity and to provide tools to analyze these data. The data help drive conservation decisions, aid in the environmental review of projects and land use changes, and provide baseline data helpful in recovering endangered species and for research projects. The Global and State Rank provides a coded rank of the conservation status of plants, animals, and natural communities that considers not just number of occurrences but other factors

including the pattern of distribution, fragmentation of the population/stands, condition of the individual populations, and historical extent as compared to the plant's modern range.

The global rank (G-Rank) is a reflection of the overall condition of an element (species or natural community) throughout its global range¹.

- G1 = Less than 6 viable element occurrences (EOs) or less than 1,000 individuals or less than 2,000 acres.
- G2 = 6-20 viable occurrences or 1,000-3,000 individuals or 2,000-10,000 acres
- G3 = 21-80 viable occurrences or 3,000-10,000 individuals or 10,000-50,000 acres.
- G4 = Apparently secure; this rank is clearly lower than G3 but factors exist to cause some concern; i.e., there is some threat, or somewhat narrow habitat.
- G5 = Population or stand demonstrably secure to ineradicable due to being commonly found in the world.

Subspecies receive a T-rank attached to the G-rank. With the subspecies, the G-rank reflects the condition of the entire species, whereas the T-rank reflects the global situation of just the subspecies or variety. For example for *Cardamine nuttallii* var. *gemmata*, which is ranked G5T3, the G-rank refers to the whole species range i.e., *Cardamine nuttallii*. The T-rank refers only to the global condition of var. *gemmata*.

The state rank (S-rank) is assigned much the same way as the global rank¹:

- S1 = Extremely endangered: <6 viable occurrences (EOs) or < 1,000 individuals, or 2,000 acres of occupied habitat.
- S2 = Endangered: about 6-20 EOs or 1-3,000 individuals, or 2-10,000 acres of occupied habitat.
- S3 = Restricted Range, rare: about 21-100 EOs or 3-10,000 individuals, or 10-50,000 acres of occupied habitat.
- S4 = Apparently Secure: some factors exist to cause some concern such as narrow habitat or continuing threats.
- S5 = Demonstrably Secure to ineradicable in California: commonly found throughout its historic range. No threat rank.

State ranks in California often also contain a threat designation attached to the S-rank

- .1 = very threatened
- .2 = threatened
- .3 = no current threats known

Uncertainty about the rank of an element is expressed in two major ways: by expressing the rank as a range of values: e.g., S2S3 means the rank is somewhere between S2 and S3; and by adding a ? to the rank: e.g., S2? - this represents more certainty than S2S3, but less than S2.

¹ See: Department Of Fish And Game, Biogeographic Data Branch. California Natural Diversity Database. *How to read RareFind 3 Reports*. The Resources Agency, State of California. Available: http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/RF3_Reports.pdf; see also CDFG Natural Diversity Database Special Vascular Plants, Bryophytes, and Lichens List. 2012. Accessed on-line in July and August 2012 at <http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/sppplants.pdf>

California Rare Plant Rank (CRPR)

- 1B = List 1B species: rare, threatened, or endangered in California and elsewhere.
- 2 = List 2 species: rare, threatened, or endangered in California but more common elsewhere.
- 3 = List 3 species: plants about which more information is needed to determine their status.
- .1 = seriously endangered in California.
- .2 = fairly endangered in California.
- .3 = not very endangered in California.

California Department of Fish and Game
 Natural Diversity Database
 Selected Elements by Scientific Name - Portrait
 Hiouchi & surrounding quads

| Scientific Name/Common Name | Element Code | Federal Status | State Status | GRank | SRank | CDFG or CNPS |
|--|--------------|----------------|--------------|--------|--------|--------------|
| 1 <i>Abronia umbellata</i> ssp. <i>breviflora</i> pink sand-verbena | PDNYC010N2 | | | G4G5T2 | S2.1 | 1B.1 |
| 2 <i>Arabis aculeolata</i> Waldo rock-cress | PDBRA06010 | | | G4 | S2.2 | 2.2 |
| 3 <i>Arabis koehleri</i> var. <i>stipitata</i> Koehler's stipitate rock-cress | PDBRA060Z2 | | | G3T3 | S1.3 | 1B.3 |
| 4 <i>Arabis macdonaldiana</i> Mcdonald's rock-cress | PDBRA06150 | Endangered | Endangered | G2 | S2.1 | 1B.1 |
| 5 <i>Asplenium trichomanes</i> ssp. <i>trichomanes</i> maidenhair spleenwort | PPASP021K2 | | | G5T5 | S2.3 | 2.3 |
| 6 <i>Boschniakia hookeri</i> small groundcone | PDORO01010 | | | G5 | S1S2 | 2.3 |
| 7 <i>Calamagrostis crassiglumis</i> Thurber's reed grass | PMPOA17070 | | | G3Q | S1.2 | 2.1 |
| 8 <i>Calystegia atriplicifolia</i> ssp. <i>buttensis</i> Butte County morning-glory | PDCON04012 | | | G5T3 | S3 | 4.2 |
| 9 <i>Cardamine nuttallii</i> var. <i>gemmata</i> yellow-tubered toothwort | PDBRA0K0R3 | | | G5T3 | S2.2 | 1B.3 |
| 10 <i>Carex lenticularis</i> var. <i>limnophila</i> lagoon sedge | PMCYP037A7 | | | G5T5 | S1S2.2 | 2.2 |
| 11 <i>Carex leptalea</i> bristle-stalked sedge | PMCYP037E0 | | | G5 | S2? | 2.2 |
| 12 <i>Carex lyngbyei</i> Lyngbye's sedge | PMCYP037Y0 | | | G5 | S2.2 | 2.2 |
| 13 <i>Carex praticola</i> northern meadow sedge | PMCYP03B20 | | | G5 | S2S3 | 2.2 |
| 14 <i>Carex serpenticola</i> serpentine sedge | PMCYP03KM0 | | | G4 | S2.3 | 2.3 |
| 15 <i>Carex viridula</i> var. <i>viridula</i> green yellow sedge | PMCYP03EM3 | | | G5T5 | S1.3 | 2.3 |
| 16 <i>Castilleja affinis</i> ssp. <i>litoralis</i> Oregon coast paintbrush | PDSCR0D012 | | | G4G5T4 | S2.2 | 2.2 |
| 17 <i>Castilleja miniata</i> ssp. <i>elata</i> Siskiyou paintbrush | PDSCR0D213 | | | G5T3 | S2.2 | 2.2 |
| 18 <i>Cochlearia officinalis</i> var. <i>arctica</i> arctic spoonwort | PDBRA0S032 | | | G5T3T4 | S1.3 | 2.3 |
| 19 <i>Coptis laciniata</i> Oregon goldthread | PDRAN0A020 | | | G4G5 | S2.2 | 2.2 |
| 20 <i>Empetrum nigrum</i> ssp. <i>hermaphroditum</i> mountain crowberry | PDEMP03021 | | | G5T5 | S2? | 2.2 |
| 21 <i>Eriogonum nudum</i> var. <i>paralinum</i> Del Norte buckwheat | PDPGN08498 | | | G5T2T4 | S2? | 2.2 |
| 22 <i>Eriogonum pendulum</i> Waldo wild buckwheat | PDPGN084Q0 | | | G4 | S2.2 | 2.2 |
| 23 <i>Erythronium hendersonii</i> Henderson's fawn lily | PMLIL0U070 | | | G4 | S1.3 | 2.3 |

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|--|--------------|----------------|--------------|--------|-------|--------------|
| 24 Erythronium howellii Howell's fawn lily | PMLIL0U080 | | | G3G4 | S2.3 | 1B.3 |
| 25 Erythronium oregonum giant fawn lily | PMLIL0U0C0 | | | G5 | S2.2 | 2.2 |
| 26 Erythronium revolutum coast fawn lily | PMLIL0U0F0 | | | G4 | S3 | 2.2 |
| 27 Fissidens pauperculus minute pocket moss | NBMUS2W0U0 | | | G3? | S1.2 | 1B.2 |
| 28 Gentiana setigera Mendocino gentian | PDGEN060S0 | | | G2 | S1 | 1B.2 |
| 29 Gilia capitata ssp. pacifica Pacific gilia | PDPLM040B6 | | | G5T3T4 | S2.2? | 1B.2 |
| 30 Gilia millefoliata dark-eyed gilia | PDPLM04130 | | | G2 | S2.2 | 1B.2 |
| 31 Hesperevax sparsiflora var. brevifolia short-leaved evax | PDASTE5011 | | | G4T2T3 | S2S3 | 1B.2 |
| 32 Hierochloa odorata nodding vanilla-grass | PMPOA35040 | | | G5 | S1.3? | 2.3 |
| 33 Lathyrus japonicus seaside pea | PDFAB250C0 | | | G5 | S1.1 | 2.1 |
| 34 Lathyrus palustris marsh pea | PDFAB250P0 | | | G5 | S2S3 | 2.2 |
| 35 Lewisia oppositifolia opposite-leaved lewisia | PDPOR040B0 | | | G4 | S2.2 | 2.2 |
| 36 Lilium occidentale western lily | PMLIL1A0G0 | Endangered | Endangered | G1 | S1.2 | 1B.1 |
| 37 Lomatium martindalei Coast Range lomatium | PDAPI1B140 | | | G5 | S2.3 | 2.3 |
| 38 Minuartia howellii Howell's sandwort | PDCAR0G0F0 | | | G4 | S3.2 | 1B.3 |
| 39 Mitella caulescens leafy-stemmed mitrewort | PDSAX0N020 | | | G5 | S4.2 | 4.2 |
| 40 Monotropa uniflora ghost-pipe | PDMON03030 | | | G5 | S2S3 | 2.2 |
| 41 Oenothera wolfii Wolf's evening-primrose | PDONA0C1K0 | | | G1 | S1.1 | 1B.1 |
| 42 Packera bolanderi var. bolanderi seacoast ragwort | PDAST8H0H1 | | | G4T4 | S1.2 | 2.2 |
| 43 Packera hesperia western ragwort | PDAST8H1L0 | | | G3 | S1.2 | 2.2 |
| 44 Phacelia argentea sand dune phacelia | PDHYD0C070 | | | G2 | S1.1 | 1B.1 |
| 45 Pinguicula macroceras horned butterwort | PDLNT01040 | | | G5 | S3.2 | 2.2 |
| 46 Piperia candida white-flowered rein orchid | PMORC1X050 | | | G3 | S3.2 | 1B.2 |

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| Scientific Name/Common Name | Element Code | Federal Status | State Status | GRank | SRank | CDFG or CNPS |
|---|--------------|----------------|--------------|--------|--------|--------------|
| 47 Polemonium carneum Oregon polemonium | PDPLM0E050 | | | G4 | S1 | 2.2 |
| 48 Potamogeton foliosus var. fibrillosus fibrous pondweed | PMPOT030B1 | | | G5T2T4 | S1S2 | 2.3 |
| 49 Pyrrocoma racemosa var. congesta Del Norte pyrrocoma | PDASTDT0F4 | | | G5T4 | S2.3 | 2.3 |
| 50 Romanzoffia tracyi Tracy's romanzoffia | PDHYD0E030 | | | G4 | S1.3 | 2.3 |
| 51 Sagittaria sanfordii Sanford's arrowhead | PMALI040Q0 | | | G3 | S3.2 | 1B.2 |
| 52 Sanguisorba officinalis great burnet | PDR0S1L060 | | | G5? | S2.2 | 2.2 |
| 53 Saxifraga nuttallii Nuttall's saxifrage | PDSAX0U160 | | | G4? | S1.1 | 2.1 |
| 54 Sidalcea malachroides maple-leaved checkerbloom | PDMAL110E0 | | | G3G4 | S3S4.2 | 4.2 |
| 55 Sidalcea malviflora ssp. patula Siskiyou checkerbloom | PDMAL110F9 | | | G5T1 | S1.1 | 1B.2 |
| 56 Sidalcea oregana ssp. eximia coast sidalcea | PDMAL110K9 | | | G5T1 | S1.2 | 1B.2 |
| 57 Silene serpentinicola serpentine catchfly | PDCAR0U2B0 | | | G2 | S2.2 | 1B.2 |
| 58 Streptanthus howellii Howell's jewel-flower | PDBRA2G0N0 | | | G2 | S1.2 | 1B.2 |
| 59 Trientalis arctica arctic starflower | PDPRI0A030 | | | G5 | S1.2 | 2.2 |
| 60 Usnea longissima long-beard lichen | NLLEC5P420 | | | G4 | S4.2 | |
| 61 Vaccinium scoparium little-leaved huckleberry | PDERI180Y0 | | | G5 | S2.2? | 2.2 |
| 62 Viola langsdorfii Langsdorf's violet | PDVIO04100 | | | G4 | S1.1 | 2.1 |
| 63 Viola palustris alpine marsh violet | PDVIO041G0 | | | G5 | S1S2 | 2.2 |
| 64 Viola primulifolia ssp. occidentalis western white bog violet | PDVIO040Y2 | | | G5T2 | S2.2 | 1B.2 |

California Department of Fish and Game
Natural Diversity Database
Selected Elements by Common Name - Portrait
Hiouchi & surrounding quads

| Common Name/Scientific Name | Element Code | Federal Status | State Status | GRank | SRank | CDFG or CNPS |
|---------------------------------------|--------------|----------------|--------------|-------|-------|-----------------|
| 1 Coastal Brackish Marsh | CTT52200CA | | | G2 | S2.1 | |
| 2 Coastal and Valley Freshwater Marsh | CTT52410CA | | | G3 | S2.1 | |
| 3 Darlingtonia Seep | CTT51120CA | | | G4 | S3.2 | |
| 4 Northern Coastal Salt Marsh | CTT52110CA | | | G3 | S3.2 | |

California Department of Fish and Game
 Natural Diversity Database
 Selected Elements by Scientific Name - Portrait
 Shelly Creek Ridge + Hurdygurdy Butte & surrounding quads

| Scientific Name/Common Name | Element Code | Federal Status | State Status | GRank | SRank | CDFG or CNPS |
|--|--------------|----------------|--------------|--------|-------|--------------|
| 1 Arabis aculeolata Waldo rock-cress | PDBRA06010 | | | G4 | S2.2 | 2.2 |
| 2 Arabis koehleri var. stipitata Koehler's stipitate rock-cress | PDBRA060Z2 | | | G3T3 | S1.3 | 1B.3 |
| 3 Arabis macdonaldiana Mcdonald's rock-cress | PDBRA06150 | Endangered | Endangered | G2 | S2.1 | 1B.1 |
| 4 Asarum marmoratum marbled wild-ginger | PDARI02070 | | | G3G4 | S1.3 | 2.3 |
| 5 Cardamine nuttallii var. gemmata yellow-tubered toothwort | PDBRA0K0R3 | | | G5T3 | S2.2 | 1B.3 |
| 6 Carex leptalea bristle-stalked sedge | PMCYP037E0 | | | G5 | S2? | 2.2 |
| 7 Carex serpenticola serpentine sedge | PMCYP03KM0 | | | G4 | S2.3 | 2.3 |
| 8 Carex viridula var. viridula green yellow sedge | PMCYP03EM3 | | | G5T5 | S1.3 | 2.3 |
| 9 Castilleja miniata ssp. elata Siskiyou paintbrush | PDSCR0D213 | | | G5T3 | S2.2 | 2.2 |
| 10 Coptis laciniata Oregon goldthread | PDRAN0A020 | | | G4G5 | S2.2 | 2.2 |
| 11 Draba carnosula Mt. Eddy draba | PDBRA112T0 | | | G2 | S2.2 | 1B.3 |
| 12 Epilobium oregonum Oregon fireweed | PDONA060P0 | | | G2 | S2.2 | 1B.2 |
| 13 Erigeron bloomeri var. nudatus Waldo daisy | PDAST3M0M2 | | | G5T4 | S2? | 2.3 |
| 14 Eriogonum pendulum Waldo wild buckwheat | PDPGN084Q0 | | | G4 | S2.2 | 2.2 |
| 15 Erythronium howellii Howell's fawn lily | PMLIL0U080 | | | G3G4 | S2.3 | 1B.3 |
| 16 Erythronium oregonum giant fawn lily | PMLIL0U0C0 | | | G5 | S2.2 | 2.2 |
| 17 Erythronium revolutum coast fawn lily | PMLIL0U0F0 | | | G4 | S3 | 2.2 |
| 18 Gentiana setigera Mendocino gentian | PDGEN060S0 | | | G2 | S1 | 1B.2 |
| 19 Gilia capitata ssp. pacifica Pacific gilia | PDPLM040B6 | | | G5T3T4 | S2.2? | 1B.2 |
| 20 Horkelia congesta ssp. nemorosa Josephine horkelia | PDROS0W032 | | | G4T4? | S1.1 | 2.1 |
| 21 Juncus regelii Regel's rush | PMJUN012D0 | | | G4? | S1.3? | 2.3 |
| 22 Lewisia oppositifolia opposite-leaved lewisia | PDPOR040B0 | | | G4 | S2.2 | 2.2 |
| 23 Lomatium martindalei Coast Range lomatium | PDAPI1B140 | | | G5 | S2.3 | 2.3 |

California Department of Fish and Game
 Natural Diversity Database
 Selected Elements by Scientific Name - Portrait
 Shelly Creek Ridge + Hurdygurdy Butte & surrounding quads

| Scientific Name/Common Name | Element Code | Federal Status | State Status | GRank | SRank | CDFG or CNPS |
|---|--------------|----------------|--------------|-------|-------|--------------|
| 24 <i>Mertensia bella</i> Oregon lungwort | PDBOR0N040 | | | G4 | S2S3 | 2.2 |
| 25 <i>Minuartia howellii</i> Howell's sandwort | PDCAR0G0F0 | | | G4 | S3.2 | 1B.3 |
| 26 <i>Packera bolanderi</i> var. <i>bolanderi</i> seacoast ragwort | PDAST8H0H1 | | | G4T4 | S1.2 | 2.2 |
| 27 <i>Packera hesperia</i> western ragwort | PDAST8H1L0 | | | G3 | S1.2 | 2.2 |
| 28 <i>Phacelia leonis</i> Siskiyou phacelia | PDHYD0C2N0 | | | G2 | S2.2 | 1B.3 |
| 29 <i>Pinguicula macroceras</i> horned butterwort | PDLNT01040 | | | G5 | S3.2 | 2.2 |
| 30 <i>Piperia candida</i> white-flowered rein orchid | PMORC1X050 | | | G3 | S3.2 | 1B.2 |
| 31 <i>Pyrrocoma racemosa</i> var. <i>congesta</i> Del Norte pyrrocoma | PDASTD0F4 | | | G5T4 | S2.3 | 2.3 |
| 32 <i>Rubus nivalis</i> snow dwarf bramble | PDROS1K4S0 | | | G4? | S1.3? | 2.3 |
| 33 <i>Sanguisorba officinalis</i> great burnet | PDROS1L060 | | | G5? | S2.2 | 2.2 |
| 34 <i>Schoenoplectus subterminalis</i> water bulrush | PMCYP0Q1G0 | | | G4G5 | S2S3 | 2.3 |
| 35 <i>Sedum divergens</i> Cascade stonecrop | PDCRA0A0B0 | | | G5? | S1.3 | 2.3 |
| 36 <i>Sedum laxum</i> ssp. <i>flavidum</i> pale yellow stonecrop | PDCRA0A0L2 | | | G5T3Q | S3.3 | 4.3 |
| 37 <i>Silene serpentinicola</i> serpentine catchfly | PDCAR0U2B0 | | | G2 | S2.2 | 1B.2 |
| 38 <i>Streptanthus howellii</i> Howell's jewel-flower | PDBRA2G0N0 | | | G2 | S1.2 | 1B.2 |
| 39 <i>Usnea longissima</i> long-beard lichen | NLLEC5P420 | | | G4 | S4.2 | |
| 40 <i>Vaccinium scoparium</i> little-leaved huckleberry | PDERI180Y0 | | | G5 | S2.2? | 2.2 |
| 41 <i>Viola primulifolia</i> ssp. <i>occidentalis</i> western white bog violet | PDVIO040Y2 | | | G5T2 | S2.2 | 1B.2 |

California Department of Fish and Game

Natural Diversity Database

Selected Elements by Common Name - Portrait

Shelly Creek + Hurdygurdy Butte & surrounding quads

| Common Name/Scientific Name | Element Code | Federal Status | State Status | GRank | SRank | CDFG or CNPS |
|-----------------------------|--------------|----------------|--------------|-------|-------|-----------------|
| 1 Darlingtonia Seep | CTT51120CA | | | G4 | S3.2 | |
| 2 Upland Douglas Fir Forest | CTT82420CA | | | G4 | S3.1 | |

CNPS Inventory of Rare and Endangered Plants

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- Several report formats are available. Use the CSV and XML options to download raw data.

| open | save | scientific | common | family | CNPS |
|---|------|---|--------------------------------|------------------|-----------|
|  | | <u>Arabis aculeolata</u>  | Waldo rock cress | Brassicaceae | List 2.2 |
|  | | <u>Arabis koehleri</u> var. <u>stipitata</u>  | Koehler's stipitate rock cress | Brassicaceae | List 1B.3 |
|  | | <u>Arabis macdonaldiana</u>  | McDonald's rock cress | Brassicaceae | List 1B.1 |
|  | | <u>Asarum marmoratum</u>  | marbled wild-ginger | Aristolochiaceae | List 2.3 |
|  | | <u>Cardamine nuttallii</u> var. <u>gemmata</u>  | yellow-tubered toothwort | Brassicaceae | List 1B.3 |
|  | | <u>Carex leptalea</u>  | bristle-stalked sedge | Cyperaceae | List 2.2 |
|  | | <u>Carex serpenticola</u>  | serpentine sedge | Cyperaceae | List 2.3 |
|  | | <u>Carex viridula</u> var. <u>viridula</u>  | green yellow sedge | Cyperaceae | List 2.3 |
|  | | <u>Castilleja miniata</u> ssp. <u>elata</u>  | Siskiyou paintbrush | Scrophulariaceae | List 2.2 |
|  | | <u>Coptis laciniata</u>  | Oregon goldthread | Ranunculaceae | List 2.2 |
|  | | <u>Draba carnosula</u>  | Mt. Eddy draba | Brassicaceae | List 1B.3 |
|  | | <u>Epilobium oreganum</u>  | Oregon fireweed | Onagraceae | List 1B.2 |
|  | | <u>Erigeron bloomeri</u> var. <u>nudatus</u>  | Waldo daisy | Asteraceae | List 2.3 |
|  | | <u>Eriogonum pendulum</u>  | Waldo wild buckwheat | Polygonaceae | List 2.2 |
|  | | <u>Erythronium howellii</u>  | Howell's fawn lily | Liliaceae | List 1B.3 |

| | | | | |
|---|---|--------------------------------|------------------|-----------|
|  | <u>Erythronium oregonum</u>  | giant fawn lily | Liliaceae | List 2.2 |
|  | <u>Erythronium revolutum</u>  | coast fawn lily | Liliaceae | List 2.2 |
|  | <u>Gentiana setigera</u>  | Mendocino gentian | Gentianaceae | List 1B.2 |
|  | <u>Gilia capitata</u> ssp. <u>pacifica</u>  | Pacific gilia | Polemoniaceae | List 1B.2 |
|  | <u>Horkelia congesta</u> ssp. <u>nemorosa</u>  | Josephine horkelia | Rosaceae | List 2.1 |
|  | <u>Iris bracteata</u>  | Siskiyou iris | Iridaceae | List 3.3 |
|  | <u>Juncus regelii</u> | Regel's rush | Juncaceae | List 2.3 |
|  | <u>Lewisia oppositifolia</u>  | opposite-leaved lewisia | Portulacaceae | List 2.2 |
|  | <u>Lomatium martindalei</u>  | Coast Range lomatium | Apiaceae | List 2.3 |
|  | <u>Mertensia bella</u>  | Oregon lungwort | Boraginaceae | List 2.2 |
|  | <u>Minuartia howellii</u>  | Howell's sandwort | Caryophyllaceae | List 1B.3 |
|  | <u>Packera bolanderi</u> var. <u>bolanderi</u>  | seacoast ragwort | Asteraceae | List 2.2 |
|  | <u>Packera hesperia</u> | western ragwort | Asteraceae | List 2.2 |
|  | <u>Pinguicula macroceras</u>  | horned butterwort | Lentibulariaceae | List 2.2 |
|  | <u>Piperia candida</u>  | white-flowered rein orchid | Orchidaceae | List 1B.2 |
|  | <u>Pyrrocoma racemosa</u> var. <u>congesta</u>  | Del Norte pyrrocoma | Asteraceae | List 2.3 |
|  | <u>Rubus nivalis</u> | snow dwarf bramble | Rosaceae | List 2.3 |
|  | <u>Sanguisorba officinalis</u>  | great burnet | Rosaceae | List 2.2 |
|  | <u>Schoenoplectus subterminalis</u>  | water bulrush | Cyperaceae | List 2.3 |
|  | <u>Silene serpentinicola</u>  | serpentine catchfly | Caryophyllaceae | List 1B.2 |
|  | <u>Streptanthus howellii</u>  | Howell's jewel-flower | Brassicaceae | List 1B.2 |
|  | <u>Vaccinium coccineum</u>  | Siskiyou Mountains huckleberry | Ericaceae | List 3.3 |

| | | | | |
|---|--|------------------------------|-----------|-----------|
|  | <u>Vaccinium scoparium</u>  | little-leaved huckleberry | Ericaceae | List 2.2 |
|  | <u>Viola primulifolia ssp. occidentalis</u>  | western white bog violet | Violaceae | List 1B.2 |

CNPS Inventory of Rare and Endangered Plants

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- During each visit, we provide you with an empty "Plant Press" for collecting items of interest.
- Several report formats are available. Use the CSV or XML options to download raw data.

| open | save | scientific | common | family | CNPS |
|------|------|---|--------------------------------|---------------|-----------|
| | | <u>Abronia umbellata</u> ssp. <u>breviflora</u> | pink sand-verbena | Nyctaginaceae | List 1B.1 |
| | | <u>Arabis aculeolata</u> | Waldo rock cress | Brassicaceae | List 2.2 |
| | | <u>Arabis koehleri</u> var. <u>stipitata</u> | Koehler's stipitate rock cress | Brassicaceae | List 1B.3 |
| | | <u>Arabis macdonaldiana</u> | McDonald's rock cress | Brassicaceae | List 1B.1 |
| | | <u>Asplenium trichomanes</u> ssp. <u>trichomanes</u> | maidenhair spleenwort | Aspleniaceae | List 2.3 |
| | | <u>Boschniakia hookeri</u> | small groundcone | Orobanchaceae | List 2.3 |
| | | <u>Calamagrostis crassiglumis</u> | Thurber's reed grass | Poaceae | List 2.1 |
| | | <u>Cardamine nuttallii</u> var. <u>gemmata</u> | yellow-tubered toothwort | Brassicaceae | List 1B.3 |
| | | <u>Carex lenticularis</u> var. <u>limnophila</u> | lagoon sedge | Cyperaceae | List 2.2 |
| | | <u>Carex leptalea</u> | bristle-stalked sedge | Cyperaceae | List 2.2 |
| | | <u>Carex lyngbyei</u> | Lyngbye's sedge | Cyperaceae | List 2.2 |
| | | <u>Carex praticola</u> | northern meadow sedge | Cyperaceae | List 2.2 |
| | | <u>Carex serpenticola</u> | serpentine sedge | Cyperaceae | List 2.3 |
| | | <u>Carex viridula</u> var. <u>viridula</u> | green yellow sedge | Cyperaceae | List 2.3 |

| | | | | |
|---|--|-------------------------|------------------|-----------|
|  | <u>Castilleja affinis ssp. litoralis</u>  | Oregon coast paintbrush | Scrophulariaceae | List 2.2 |
|  | <u>Castilleja miniata ssp. elata</u>  | Siskiyou paintbrush | Scrophulariaceae | List 2.2 |
|  | <u>Cochlearia officinalis var. arctica</u> | arctic spoonwort | Brassicaceae | List 2.3 |
|  | <u>Coptis laciniata</u>  | Oregon goldthread | Ranunculaceae | List 2.2 |
|  | <u>Empetrum nigrum ssp. hermaphroditum</u> | mountain crowberry | Empetraceae | List 2.2 |
|  | <u>Eriogonum nudum var. paralinum</u> | Del Norte buckwheat | Polygonaceae | List 2.2 |
|  | <u>Eriogonum pendulum</u>  | Waldo wild buckwheat | Polygonaceae | List 2.2 |
|  | <u>Erythronium hendersonii</u>  | Henderson's fawn lily | Liliaceae | List 2.3 |
|  | <u>Erythronium howellii</u>  | Howell's fawn lily | Liliaceae | List 1B.3 |
|  | <u>Erythronium oregonum</u>  | giant fawn lily | Liliaceae | List 2.2 |
|  | <u>Erythronium revolutum</u>  | coast fawn lily | Liliaceae | List 2.2 |
|  | <u>Fissidens pauperculus</u> | minute pocket moss | Fissidentaceae | List 1B.2 |
|  | <u>Gentiana setigera</u>  | Mendocino gentian | Gentianaceae | List 1B.2 |
|  | <u>Gilia capitata ssp. pacifica</u>  | Pacific gilia | Polemoniaceae | List 1B.2 |
|  | <u>Gilia millefoliata</u>  | dark-eyed gilia | Polemoniaceae | List 1B.2 |
|  | <u>Hesperevax sparsiflora var. brevifolia</u>  | short-leaved evax | Asteraceae | List 1B.2 |
|  | <u>Hierochloe odorata</u>  | vanilla-grass | Poaceae | List 2.3 |
|  | <u>Iris bracteata</u>  | Siskiyou iris | Iridaceae | List 3.3 |
|  | <u>Lathyrus japonicus</u>  | seaside pea | Fabaceae | List 2.1 |
|  | <u>Lathyrus palustris</u>  | marsh pea | Fabaceae | List 2.2 |
|  | <u>Lewisia oppositifolia</u>  | opposite-leaved lewisia | Portulacaceae | List 2.2 |
| | <u>Lilium occidentale</u> | western lily | Liliaceae | List 1B.1 |

| | | | | |
|---|---|-------------------------------|------------------|-----------|
|  | <u>Lomatium martindalei</u>  | Coast Range lomatium | Apiaceae | List 2.3 |
|  | <u>Minuartia howellii</u>  | Howell's sandwort | Caryophyllaceae | List 1B.3 |
|  | <u>Monotropa uniflora</u>  | ghost-pipe | Ericaceae | List 2.2 |
|  | <u>Oenothera wolfii</u>  | Wolf's evening- primrose | Onagraceae | List 1B.1 |
|  | <u>Packera bolanderi</u> var. <u>bolanderi</u>  | seacoast ragwort | Asteraceae | List 2.2 |
|  | <u>Packera hesperia</u> | western ragwort | Asteraceae | List 2.2 |
|  | <u>Phacelia argentea</u>  | sand dune phacelia | Hydrophyllaceae | List 1B.1 |
|  | <u>Pinguicula macroceras</u>  | horned butterwort | Lentibulariaceae | List 2.2 |
|  | <u>Piperia candida</u>  | white-flowered rein orchid | Orchidaceae | List 1B.2 |
|  | <u>Polemonium carneum</u>  | Oregon polemonium | Polemoniaceae | List 2.2 |
|  | <u>Potamogeton foliosus</u> var. <u>fibrillosus</u> | fibrous pondweed | Potamogetonaceae | List 2.3 |
|  | <u>Pyrrocoma racemosa</u> var. <u>congesta</u>  | Del Norte pyrrocoma | Asteraceae | List 2.3 |
|  | <u>Romanzoffia tracyi</u> | Tracy's romanzoffia | Hydrophyllaceae | List 2.3 |
|  | <u>Sagittaria sanfordii</u>  | Sanford's arrowhead | Alismataceae | List 1B.2 |
|  | <u>Sanguisorba officinalis</u>  | great burnet | Rosaceae | List 2.2 |
|  | <u>Saxifraga nuttallii</u> | Nuttall's saxifrage | Saxifragaceae | List 2.1 |
|  | <u>Sidalcea malviflora</u> ssp. <u>patula</u>  | Siskiyou checkerbloom | Malvaceae | List 1B.2 |
|  | <u>Sidalcea oregana</u> ssp. <u>eximia</u> | coast checkerbloom | Malvaceae | List 1B.2 |
|  | <u>Silene serpentinicola</u>  | serpentine catchfly | Caryophyllaceae | List 1B.2 |
|  | <u>Streptanthus howellii</u>  | Howell's jewel-flower | Brassicaceae | List 1B.2 |
|  | <u>Trientalis arctica</u>  | arctic starflower | Primulaceae | List 2.2 |
|  | <u>Vaccinium scoparium</u>  | little-leaved huckleberry | Ericaceae | List 2.2 |

| | | | | |
|---|--|--------------------------|-----------|-----------|
|  | <u>Viola langsdorfii</u> | Langsdorf's violet | Violaceae | List 2.1 |
|  | <u>Viola palustris</u>  | alpine marsh violet | Violaceae | List 2.2 |
|  | <u>Viola primulifolia ssp. occidentalis</u>  | western white bog violet | Violaceae | List 1B.2 |