

# 197/199 Safe STAA Access Project



## **Volume II** **Final Environmental Impact Report/ Environmental Assessment and** **Section 4(f) Evaluation**

### **Appendices A through S**

**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;  
Washington/Narrows, 01-DN-199 PM 22.7-23.0, & PM 26.3-26.5  
EA: 01-48110, 01-45490, 01-47940, 01-4500U

**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.

**April 2013**





# Appendix A CEQA Checklist

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# CEQA Environmental Checklist

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

Ruby 1=PM 4.5; Ruby 2=PM 3.2-4.0; Patrick Creek Narrows=PM 20.5-20.9, PM 23.92-24.08, & PM 25.55-25.65; The Narrows=PM 22.7-23.0; & Washington Curve=PM 26.3-26.5

Ruby 1=01-48110, Ruby 2=01-45490, Patrick Creek Narrows=01-47940, The Narrows=01-45000, Washington Curve=01-44830

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P.M/P.M.

E.A.

This checklist identifies physical, biological, social and economic factors that might be affected by the proposed project. In many cases, background studies performed in connection with the projects indicate no impacts. A NO IMPACT answer in the last column reflects this determination. Where there is a need for clarifying discussion, the discussion is included either following the applicable section of the checklist or is within the body of the environmental document itself. The words "significant" and "significance" used throughout the following checklist are related to CEQA, not NEPA, impacts. The questions in this form are intended to encourage the thoughtful assessment of impacts and do not represent thresholds of significance.

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	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
<b>I. AESTHETICS:</b> Would the project:				
a) Have a substantial adverse effect on a scenic vista	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**II. AGRICULTURE AND FOREST RESOURCES:** In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and the forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**III. AIR QUALITY:** Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:

a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non- attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**IV. BIOLOGICAL RESOURCES:** Would the project:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**V. CULTURAL RESOURCES:** Would the project:

a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**VI. GEOLOGY AND SOILS:** Would the project:

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**VII. GREENHOUSE GAS EMISSIONS:** Would the project:

- a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?
- b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

An assessment of the greenhouse gas emissions and climate change is included in the body of environmental document. While Caltrans has included this good faith effort in order to provide the public and decision-makers as much information as possible about the project, it is Caltrans determination that in the absence of further regulatory or scientific information related to GHG emissions and CEQA significance, it is too speculative to make a significance determination regarding the project's direct and indirect impact with respect to climate change. Caltrans does remain firmly committed to implementing measures to help reduce the potential effects of the project. These measures are outlined in the body of the environmental document.

**VIII. HAZARDS AND HAZARDOUS MATERIALS:** Would the project:

- a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?
- b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?
- c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**IX. HYDROLOGY AND WATER QUALITY:** Would the project:

a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
j) Inundation by seiche, tsunami, or mudflow	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**X. LAND USE AND PLANNING:** Would the project:

a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**XI. MINERAL RESOURCES:** Would the project:

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**XII. NOISE:** Would the project result in:

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**XIII. POPULATION AND HOUSING:** Would the project:

a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**XIV. PUBLIC SERVICES:**

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
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**XV. RECREATION:**

- |  |                          |                          |                          |                                     |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?                        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

**XVI. TRANSPORTATION/TRAFFIC:** Would the project:

- |   |                          |                          |                                     |                                     |
|---|--------------------------|--------------------------|-------------------------------------|-------------------------------------|
| a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?  | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| e) Result in inadequate emergency access?   | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

**XVII. UTILITIES AND SERVICE SYSTEMS:** Would the project:

- |  |                          |                          |                          |                                     |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**XVIII. MANDATORY FINDINGS OF SIGNIFICANCE**

a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>



## Appendix B Resources Evaluated Relative to the Requirements of Section 4(f)

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# Appendix B Resources Evaluated Relative to the Requirements of Section 4(f)

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The environmental review, consultation, and any other action required in accordance with applicable federal laws for the 197/199 Safe STAA Access Project (proposed project) is being carried out by the California Department of Transportation (Department) under its assumption of responsibility pursuant to 23 United States Code (USC) 327.

## B.1 Introduction

The Department is proposing to construct improvements on State Route (SR) 197 and U.S. Highway (US) 199 in Del Norte County to reclassify these 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. This Section 4(f) evaluation was prepared for the proposed project. This evaluation provides an overview of resources analyzed relative to the requirements of Section 4(f) located within 0.5 mile of the proposed project.

### B.1.1 Regulatory Setting

Section 4(f) of the Department of Transportation Act of 1966, codified in federal law at 49 USC 303, declares that “it is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites.”

Section 4(f) specifies that the Secretary of Transportation may approve a transportation program or project requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or land of a historic site of national, state, or local significance (as determined by the federal, state, or local officials having jurisdiction over the park, area, refuge, or site) only if:

- there is no prudent and feasible alternative to using that land; and
- the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.

Section 4(f) further requires consultation with the U.S. Department of the Interior and, as appropriate, the involved offices of the U.S. Department of Agriculture (USDA) and U.S. Department of Housing and Urban Development (HUD) in developing transportation projects and programs that use lands protected by Section 4(f). Coordination with the State Historic Preservation Officer is also needed if historic sites are involved. According to the Federal Highway Administration’s (FHWA’s) *Section 4(f) Policy Paper* (2005), preliminary coordination with the USDA should be with the appropriate National Forest Supervisor.

Coordination with HUD should occur whenever a project uses a Section 4(f) resource where HUD funding has been used.

Section 4(f) use, as defined in 23 Code of Federal Regulations (CFR) 774.17, occurs when any of the following takes place:

- Land is permanently incorporated into a transportation facility.
- There is a temporary occupancy of land that is adverse in terms of the statute's preservation purpose as determined by the criteria in 23 CFR 774.13(d).
- There is a constructive use of a Section 4(f) property as determined by the criteria in 23 CFR 774.15.

The requirements of Section 4(f) will be considered satisfied with respect to a Section 4(f) resource if it is determined that a transportation project will have only a "*de minimis* impact" on the resource. The provision allows avoidance, minimization, mitigation, and enhancement measures to be considered in making the *de minimis* determination. The agencies with jurisdiction must concur in writing with the determination. Additional requirements for a *de minimis* impact finding include providing the public an opportunity to review and comment on the effects of the proposed project on the Section 4(f) resource. For historic properties, the National Historic Preservation Act Section 106 consultation process fulfills the public review requirement. A *de minimis impact* is defined in 23 CFR 774.17 as follows:

- For parks, recreation areas, and wildlife and waterfowl refuges, a *de minimis* impact is one that will not adversely affect the features, attributes, or activities qualifying the property for protection under Section 4(f).
- For historic sites, a *de minimis* impact means that the Department has determined, in accordance with 36 CFR Part 800, that no historic property is affected by the proposed project, or the proposed project will have "no adverse effect" on the property in question.

Per Section 6009(a) of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), once the U.S. Department of Transportation (DOT) determines that a transportation use of Section 4(f) property results in a *de minimis* impact on the property, an analysis of avoidance alternatives is not required and the Section 4(f) evaluation process is complete.

Constructive use of a Section 4(f) property would occur when the proximity impacts of a proposed project on the Section 4(f) property were so severe that the activities, features, or attributes that qualify the property or resource for protection under Section 4(f) are substantially impaired (23 CFR 774.15). Substantial impairment occurs only when the protected activities, features, or attributes are substantially diminished by the proposed project. In other words, under a constructive-use scenario, the value of the Section 4(f) resource in terms of Section 4(f) significance (recreational or historic) would be significantly reduced or lost (Federal Highway Administration 2005).

## **B.2 Description of Proposed Project**

The Department is proposing to improve spot locations on SR 197 and US 199 in Del Norte County to allow reclassification of the SR 197–US 199 corridor as part of the STAA network of truck routes. Access to STAA trucks is currently restricted in California on the SR 197–US 199 corridor due to sub-standard curves; absence of, or substandard, shoulders along the traveled way; and/or narrow lanes in the seven proposed project locations. These conditions have been shown to result in STAA trucks offtracking into the oncoming traffic lane at the seven proposed locations. Safety-enhancing improvements, including wider lanes, wider shoulders, longer-radius curves, and enhanced sight distances, are needed at the seven proposed project locations to provide a roadway that is easier for STAA trucks to traverse; these improvements would benefit all users. These improvements would allow STAA trucks and other large vehicles to negotiate the SR 197–US 199 corridor while minimizing or eliminating offtracking into the oncoming traffic lane at the seven proposed locations.

The proposed project is made up of five previously identified, separately proposed projects that share the same general purpose. These five projects are referred to as Ruby 1, Ruby 2, Patrick Creek Narrows, the Narrows, and Washington Curve and include a total of seven locations. The proposed project makes use of the names of the previously identified projects to identify the location of each improvement currently being proposed. Within the limits of the proposed project, SR 197 and US 199 are conventional two-lane undivided highways with narrow lane and shoulder widths. The project locations are shown in Figure B-1.

### **B.2.1 Purpose and Need**

#### **B.2.1.1 Purpose**

The purpose of the proposed project is to improve spot locations on SR 197 and US 199 in Del Norte County to accommodate STAA truck travel, thereby removing the restriction for STAA vehicles and improving goods movement. 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 with trailers. The proposed project has logical termini (rational end points) because it addresses issues related to the curves that currently result in the STAA vehicle prohibition. The project has independent utility because no further improvements are required on the SR 197–US 199 corridor to lift the restriction on STAA vehicles between US 101 at Crescent City and Interstate (I) 5 at Grants Pass, Oregon.

### **B.2.1.2 Need**

The primary need for the project is the result of substandard curves; absence of, or substandard, shoulders along the traveled way; and narrow lanes. These geometric improvements are necessary within the project limits on the SR 197–US 199 corridor to allow safe STAA truck access, which would allow reclassification of the corridor as part of the STAA network of truck routes. Safety-enhancing improvements, including wider lanes, wider shoulders, longer radius curves, and improved sight distances, are needed to provide a roadway that is easier to maneuver for all users. Both the Department and Del Norte County Local Transportation Commission support this need. The project locations and the routes' regional context are shown in Figure B-1.

See Chapter 1 of the Environmental Impact Report/Environmental Assessment (EIR/EA) for a complete description detailing the need for the proposed improvements, including a discussion of the improvement needs at each project location.

### **B.2.2 Project Alternatives**

A summary of the proposed project is described below by project site. Alternatives are described where alternatives are proposed.

#### **B.2.2.1 Ruby 1 (SR 197: PM 4.5)**

One build alternative was 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 to new varying 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 culverts would be extended, one would be replaced, and a new drainage inlet would be installed.

#### **B.2.2.2 Ruby 2 (SR 197: PM 3.2 to 4.0)**

Three build alternatives were considered at this project location: Four-Foot Shoulders, Two-Foot Shoulders, and Two-Foot Widening in Spot Locations Alternatives. However, the Department selected the Two-Foot Widening in Spot Locations Alternative as the preferred alternative for this location after review of public comments on the DEIR/EA and coordinating with resource agencies. This alternative would increase the shoulder widths to 2-4 feet in spot locations and improve the existing road curve, roadbed elevation, and roadway width. To match the new roadway width, two 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 in Chapter 1 of the DEIR/EA and FEIR/EA.

#### **B.2.2.3 Patrick Creek Narrows Location 1 (US 199: PM 20.5 to 20.7)**

One build alternative was 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. Aesthetic treatment of the wall would be incorporated into the wall's design. reconstruction of the existing drainage ditch adjacent to the base of the cut slope, grinding existing asphalt-concrete to match the new superelevation, open-graded friction course (OGFC, a type of asphalt concrete) overlay to improve friction and traction, striping, a centerline rumble strip, shoulder backing, reconstructing the existing guardrail, and new metal-beam guardrail construction at the north end of the wall for approximately 75 feet. An existing 24-inch culvert at PM 20.62 would be replaced with a longer culvert to match the new roadway width at the inlet and outlet. Also, two 18-inch culverts at PM 20.57 and 20.58 would be replaced with 24-inch culverts, both with new drainage inlets. One of the culverts, at PM 20.57, would intersect the proposed retaining wall.

#### **B.2.2.4 Patrick Creek Narrows Location 2 (US 199: PM 23.9 to 24.3)**

Three alternatives for improvements were being considered at this project location: the Upstream Bridge Replacement, Downstream Bridge Replacement, and Bridge Preservation with Upslope Retaining Wall Alternatives. All would realign and widen the existing 11- to 12-foot lanes to at least 12 feet and would increase the shoulders to a width of 1 to 8 feet from the existing widths of 0 to 2 feet. A cut slope of 0.5:1 to 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 of cable mesh will be needed. This would 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. A new wall with aesthetic treatment, approximately 130 feet long and up to 4 feet high, would be constructed on the outside of the curve at PM 23.9 to support the metal-beam guardrail reconstruction. The unique features of the selected preferred alternative, the Downstream Bridge Replacement Alternative, are described below. The other two alternatives are described in Chapter 1 of the DEIR/EA and FEIR/EA.

#### ***Downstream Bridge Replacement Alternative***

This alternative would replace the existing bridge with a bridge downstream from the current location. A retaining wall would be constructed on the Oregon side of the bridge that would reach approximately 10 feet high and be 175 feet long (Figure 1-9). The existing culvert at PM 24.07 would be abandoned. A new 24 inch culvert with a Traction Sand Trap would be placed at PM 23.95 and a new 18 inch culvert would be placed at PM 24.17 to drain to a constructed bio-strip.

A retaining wall and sidehill viaduct approach would be constructed downstream from the new bridge. The retaining wall would extend for approximately 153 feet, and the viaduct would extend for approximately 95 feet and transition directly into the proposed new bridge. The retaining wall would vary in height from 10 to 20 feet and be supported along the bank of the Middle Fork Smith River. The sidehill viaduct, which would be founded on drilled piles, would support the northbound traffic lane over the bank of the Middle Fork Smith River. The arch bridge would be 250 feet long by 44 feet wide with two 12-foot-wide lanes and 8-foot shoulders. As with the Upstream Bridge Replacement Alternative, this alternative would require the use of

temporary falsework and a debris containment system. The existing bridge would be removed once the new bridge was in place.

### **B.2.2.5 Patrick Creek Narrows Location 3 (US 199: PM 25.55 to 25.65)**

One build alternative was considered for this project location. This alternative would increase the shoulder width to at least 4 feet on both sides of the road and improve 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. A drilled-pile foundation may be required. Aesthetic treatment of the wall would be incorporated. One culvert, at PM 25.55, would be replaced to match the new roadway width. Drainage inlets would be installed at the inlets for the culverts at PM 25.61 and 25.69. An area of approximately 6 ft by 14 ft of rock slope protection would be placed at the drainage outlet, above ordinary high water, to minimize erosion.

### **B.2.2.6 The Narrows (US 199: PM 22.7 to 23.0)**

The one build alternative for this location would increase lane widths to 12 feet and provide 0 to 2-foot shoulders. Widening would be accomplished by excavating into the existing cut slope. A 2-foot-wide unpaved drainage ditch would be added at the shoulder of the road. 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.

### **B.2.2.7 Washington Curve (US 199: PM 26.3 to 26.5)**

Two alternatives were considered for improvements at this location: the Cut Slope Alternative and the Retaining Wall Alternative. The Department selected as the preferred alternative for this location the Cut Slope Alternative. Proposed improvements would involve excavation of a new slope on the cut slope side of the roadway. The lanes would be 12 feet and the shoulders would be 4 feet.

### **B.2.2.8 Summary of Key Project Features at Each Location, by Selected Preferred Alternative**

Table B-1 provides a summary of key project features at each project location, by selected preferred alternative. The evaluation of alternatives was primarily based on total project cost and level of impact on sensitive environmental resources. Where improvements are proposed at a project location, the impacts related to redwood trees, biological habitats (including wetlands), noise caused by blasting, and recreation areas were considered. The possibility of a bridge replacement underscores the need to consider impacts on water quality and geologic stability. Potential impacts related to safety, geologic stability, sensitive animal and plant species and plant communities, drainage patterns, and aesthetics were also considered in the selection of alternatives. These criteria were developed to provide a range of alternatives, when feasible, that meet the project purpose and need while avoiding or minimizing potential impacts.

**Table B-1. Project Features by Location and Selected Preferred Alternative**

Project Location (and Selected Preferred Alternative)	Increased Shoulder Width	Cut Slopes	Retaining Wall	In-River Work	Controlled Blasting	Utility Relocation
<b>Ruby 1</b>	Yes, 0–4 feet	No	No	No	No	Two utility poles
<b>Ruby 2</b> (Two-Foot Widening in Spot Locations)	Yes, 2-4 feet	Yes	No	No	No	Two utility poles
<b>Patrick Creek Narrows Location 1</b>	Yes, 4 feet	No	Yes, on river side	No	No	No
<b>Patrick Creek Narrows Location 2</b> (Downstream Bridge Replacement)	Yes, 1–8 feet	Yes	Yes, on river side south of bridge, and north of bridge	No	May be required	No
<b>Patrick Creek Narrows Location 3</b>	Yes, 8 feet	No	Yes, on river side	No	No	No
<b>The Narrows</b>	Yes, 0-2 feet	Yes	No	No	Yes	No
<b>Washington Curve</b> (Cut Slope)	Yes, 4 feet	Yes	No	No	No	No

### **B.2.3 No Build (No Action) Alternative for All Seven Project Locations**

The No Build (No Action) Alternative would maintain the California Legal Advisory Route classification on both SR 197 and US 199. No improvements or widening would occur at any of the seven project locations to bring the roadways to STAA network standards, and previous legislative exceptions to STAA truck regulations in Del Norte County may be reinstated. However, some of the improvements could occur individually at the project locations to reduce continual maintenance problems or improve safety. The No Build (No Action) Alternative would not satisfy the project need or achieve the project purpose, and it would fail to be consistent with the Highways, Streets and Roads Goal in the Del Norte Local Transportation Commission’s 2008 Regional Transportation Improvement Program (RTIP; see Section 2.1.1.2 in the Final EIR/EA). A complete project description detailing the proposed improvements at each location is available in Chapter 1 of the DEIR/EA and FEIR/EA.

### **B.3 List and Description of Section 4(f) Properties**

This section discusses parks, recreational facilities, wildlife refuges, and historic properties found within or adjacent to the project area. The location of the proposed project on SR 197 and US 199 is shown in Figure B-1. Public parks, recreation areas, and facilities within 0.5 mile of the proposed project were identified to determine whether they qualify for protection as Section 4(f) resources and whether the provisions of Section 4(f) would be triggered by construction of the proposed project. The 0.5 mile area was determined to be a reasonably conservative area in which to assess potential impacts on Section 4(f) resources and is in accordance with Department guidance on complying with Section 4(f) regulations (California Department of Transportation 2010a). The public parks and recreation areas considered in this evaluation include all neighborhood, city, regional, state, and federal recreation resources in the project area.

### **B.3.1 Resources Considered but Not Evaluated**

For the purposes of Section 4(f), a historic site is significant only if it is listed or eligible for listing in the National Register of Historic Places (NRHP) and located within the areas of potential effect (APEs) for archaeological or architectural resources. The cultural resources study prepared for the project included archival research and a field survey (ICF International 2010a). No historic resources were identified in the APEs for the proposed project, including historic-era trails or mining-related features. Department cultural resources staff also indicated that no historic-era resources are known to be located within the APEs (Douglas pers. comm.). Cultural resources listed or eligible for listing in the NRHP were not found in the architectural or archaeological APEs (ICF International 2010a). Therefore, no cultural resources were eligible for Section 4(f) protection, and none is discussed in this evaluation.

In addition, no wildlife or waterfowl refuges are located within 0.5 mile of the project locations, and there are no public school playgrounds or athletic fields within 0.5 mile of the project locations along SR 197 or US 199. No USDA Forest Service–(Forest Service–) designated trails were identified within 0.5 mile of the project locations along US 199, except for the Patrick Creek Trail located near the Patrick Creek Campground.

US 199 in the project area is designated as the Smith River Scenic Byway, a National Forest Scenic Byway that traverses the Smith River National Recreation Area (NRA) for a distance of 33 miles (National Scenic Byways Program 2009). According to guidance provided in the FHWA’s *Section 4(f) Policy Paper*, the designation of a road as a scenic byway is not intended to create a park or recreation area within the meaning of the Section 4(f) statutes at 49 USC 303 or 23 USC 138. Reconstruction, rehabilitation, or relocation of a publicly owned scenic byway does not come under the purview of Section 4(f) unless the improvements were to otherwise use land from a Section 4(f) resource. Therefore, the Smith River Scenic Byway (US 199) in the project area is not considered a Section 4(f) resource in this evaluation; however, potential Section 4(f) resources along US 199 were identified and evaluated for potential effects as a result of the proposed improvements.

### **B.3.2 Recreation Resources Evaluated**

Four recreation resources were identified within 0.5 mile of the project area. The recreation resources are listed below in the order in which they occur along SR 197 from north to south and along US 199 from west to east:

- Ruby Van Deventer County Park (see Section B.8.1, below)
- Jedediah Smith Redwoods State Park (see Section B.8.2, below)
- Smith River “Wild and Scenic River” system (see Section B.8.3, below)
- Smith River NRA within the Six Rivers National Forest, including the following designated and developed recreation sites: (see Sections B.8.3.2.1, B.4, B.5, B.6, and B.7, below)
  - Sandy Beach
  - Patrick Creek Campground and Patrick Creek Trail

– Middle Fork Smith River Access Trails

As shown in Figure B-2, Ruby Van Deventer County Park is located within 0.5 mile of the Ruby 1 site. Jedediah Smith Redwoods State Park is located within 0.5 mile of the Ruby 2 site. The main stem of the Smith River, a state and federally designated Wild and Scenic River, parallels SR 197. The Middle Fork Smith River, a component of the Smith River Wild and Scenic River system, runs adjacent to US 199. Almost the entire length of US 199 in Del Norte County is encompassed by the Smith River NRA within the Six Rivers National Forest.

All four recreation resources listed above were evaluated relative to the requirements of Section 4(f), as discussed below. The Smith River NRA is discussed first because the proposed project would result in a Section 4(f) use of the property. Implementation of the proposed project would not result in a Section 4(f) use of Ruby Van Deventer County Park, Jedediah Smith Redwoods State Park, or the Smith River Wild and Scenic River system. These properties are discussed in Section B.8.

### **B.3.2.1 Smith River National Recreation Area**

Almost the entire length of US 199 in Del Norte County is located within the Six Rivers National Forest, the northernmost section of which is designated as the Smith River NRA. The Six Rivers National Forest encompasses more than 1 million acres of land in four counties in northern California (Del Norte, Humboldt, Trinity, and Siskiyou). The 300,000-acre Smith River NRA was established by Congress in the Smith River National Recreation Area Act of 1990 (Public Law 101-162). The Smith River NRA was established as a multiple-use area, with emphasis on recreation, specifically “for the purposes of ensuring the preservation, protection, enhancement, and interpretation for present and future generations of the Smith River watershed’s outstanding wild and scenic rivers, ecological diversity, and recreation opportunities while providing for the wise use and sustained productivity of its natural resources” (Public Law 101-162).

The Six Rivers National Forest is managed in accordance with the 1995 *Six Rivers National Forest Land and Resource Management Plan* (Six Rivers LRMP) (USDA Forest Service 1995). The purpose of this plan is to guide the integrated protection and use of forest resources. Within the Six Rivers LRMP, the Smith River NRA is designated as Management Area 7, which is the management unit within which US 199 and the Middle Fork Smith River fall (Figure B-3). The Smith River NRA management plan is included in the Six Rivers LRMP and provides for a broad range of recreation uses and interpretive services and facilities throughout the Smith River NRA. The plan outlines public recreation access for activities such as camping, hiking, hunting, and fishing. A variety of recreational opportunities currently exist throughout the Smith River NRA, including whitewater rafting and kayaking, bird watching, fishing, hunting, camping, and trails for hiking, horseback riding, and mountain biking. US 199 provides access to the Smith River NRA.

Within the Smith River NRA management plan, there are eight management areas; the project locations along US 199 are located within the Middle Fork–Highway 199 Management Area 3 (Figure B-4), where the management emphasis is on “maintaining wildlife values and providing for a full range of recreation uses, with particular emphasis on the scenic and recreation values associated with the Smith River, old growth redwoods, and California State Highway 199.”

Management Area 3 encompasses 38,400 acres and is the most heavily visited area within the Smith River NRA (USDA Forest Service 1992).

### **B.3.2.2 Recreation Sites within the Smith River National Recreation Area**

There are specific areas within the Smith River NRA designated and developed for recreation use by the Forest Service located within a 0.5-mile radius of the project locations, including the Middle Fork Smith River, Sandy Beach, the Patrick Creek Campground, the Patrick Creek Trail, and the Middle Fork Smith River Access Trails. These resources are discussed below, with the exception of the Middle Fork Smith River, which is discussed in Section B.8.3.

#### ***Sandy Beach***

Sandy Beach is a day-use river access area located at PM 20.9 on US 199 (USDA Forest Service 2009c). The location is demarcated by a small sign and accessed from a paved pullout on US 199. A short trail leads to a swimming area on the Middle Fork Smith River approximately 1,500 to 2,000 feet from Patrick Creek Narrows Location 1. Amenities include three picnic tables and a pit toilet (Pass pers. comm.).

#### ***Patrick Creek Campground and Patrick Creek Trail***

Three Forest Service campgrounds are located along the US 199 corridor: Panther Flat, Grassy Flat, and Patrick Creek (Figure B-2). However, the Patrick Creek Campground is the only one situated within a 0.5-mile radius of one of the project locations. It is located approximately 0.5 mile north and west of the Narrows site. The campground was constructed in the 1930s by the Civilian Conservation Corps. The Patrick Creek Lodge is directly across US 199 from the campground. The campground is located on the south side of US 199. The campground includes 13 campsites and a picnic area, and it is open from May to September with a nightly fee of \$14 per campsite. The picnic area is a no-fee, day-use-only area, open year-round with good access to the river. Access to the campground is from US 199 (USDA Forest Service 2009a). The campsites are nestled within the surrounding forest down the slope toward the river, with limited views of US 199 (ICF International 2010d).

The Patrick Creek Trail is a short (0.2-mile) paved universal-access trail from the Patrick Creek Lodge to Patrick Creek Campground via an under-the-bridge route. The trail has four interpretive stops and a barrier-free fishing platform (USDA Forest Service 2009b).

#### ***Middle Fork Smith River Access Trails***

Two informal river access trails are located within a 0.5-mile radius of the project locations along US 199: the Eagle Eye Mine Trail and Cedar Rustic Trail. These informal trails are not actively managed by the Forest Service (Pass pers. comm.) and are not designated as recreational trails. These trails provide access to the Middle Fork Smith River, mainly for seasonal recreational fishing (USDA Forest Service 2009c). The Eagle Eye Mine Trail is an informal river access located at PM 23.1 on US 199. The trail is used to access a swimming and summer fishing area on the Middle Fork Smith River. There are no improvements at this location. The Cedar Rustic Trail is located at PM 23.5 on US 199. This trail leads to an old campground that is no longer used and provides access to the river (Pass pers. comm.).

## B.4 Impacts on Smith River National Recreation Area

### Background

The Smith River NRA is located on publicly owned national forest system lands within the Six Rivers National Forest and designated as a national recreation area, making it eligible for protection under Section 4(f). US 199 is the primary access to recreation opportunities along the Middle Fork Smith River within the Smith River NRA. The Smith River NRA was established allowing for and encompassing the existing US 199 alignment. US 199 within the project limits was built in the early 1920s, before the establishment of the Smith River NRA in 1990. Section 13(c) of the Smith River National Recreation Area Act of 1990 specifies the following:

Road Easements – Nothing in this Act shall be construed as affecting the responsibilities of the State of California or any of its political subdivisions with respect to road easements, including maintenance and improvement of State Highway 199 and County Route 427.

Therefore, the Smith River NRA contemplated future improvements on US 199 and recognized the State’s responsibilities with respect to implementing such improvements. The proposed improvements along US 199 at Patrick Creek Narrows Locations 1 to and 3, the Narrows site, and the Washington Curve sites would be constructed according to the provisions of the Smith River NRA management plan.

As mentioned previously, those areas designated and developed for recreation use by the Forest Service and located within a 0.5-mile radius of the project locations include Sandy Beach, the Patrick Creek Campground, the Patrick Creek Trail, and the Middle Fork Smith River Access Trails. These resources are discussed separately, below, and were evaluated individually relative to the requirements of Section 4(f) (see Section B.4.2).

All project locations along US 199 are located on national forest system lands within the Smith River NRA. According to the project description and community impact assessment for the project, the proposed improvements at the project locations would occur within existing US Department of Transportation (USDOT) easements (Trott 2010). No developed land uses are located within the limits of the project locations along US 199, and there are no areas designated for recreation, such as campgrounds, hiking trails, or trailheads, located within the limits of the project locations. Table B-2 lists the project locations relative to the Forest Service recreation areas on US 199.

**Table B-2. Project Locations Relative to Forest Service Recreation Areas on US 199**

Project Location or Recreation Area	Post Mile on US 199
Potential staging area	19.80
Potential staging area	20.08
Potential staging area	20.19
Patrick Creek Narrows Location 1	20.50–20.90
Sandy Beach	20.90
Potential staging area	21.30

Project Location or Recreation Area	Post Mile on US 199
Patrick Creek Campground and Trail	22.00
Potential staging area	22.11
The Narrows	22.70–23.00
Eagle Eye Mine River Access Trail	23.10
Potential staging area	23.15
Cedar Rustic River Access Trail	23.50
Patrick Creek Narrows Location 2	23.92–24.08
Potential staging area	23.96
Potential staging area	25.00
Patrick Creek Narrows Location 3	25.55–25.65
Potential staging area	25.80
Potential staging area	26.15
Washington Curve	26.30–26.50

Only Patrick Creek Narrows Location 3 is adjacent to developed land uses, where several rural residential properties are located (none of these are Section 4(f) resources). However, as stated above and shown in Table B-2, areas designated for recreation use by the Forest Service are located within a 0.5-mile radius of the project locations. These resources are discussed below in Section B.4.2 relative to the requirements of Section 4(f). As noted below, the two primary impacts to the Smith River NRA would be impacts from traffic delays during construction and impacts to the cut slope at Patrick Creek Narrows Location 2, which is just outside the existing USDOT right-of-way easement.

**Impacts from Traffic Delays During Construction**

The primary impact on the Smith River NRA would be traffic delays during construction. These delays could be inconvenient for visitors traveling to and from recreation facilities within the Smith River NRA on US 199. Anticipated traffic control includes one-way reversible traffic control, full roadway closure without a detour, and shoulder closure. Table B-3 presents the preliminary construction schedule with the number of working days by project location for the selected preferred alternatives.

**Table B-3. Preliminary Construction Schedule Timetable with Number of Work Days by Location**

Project Location (All Alternatives)	Construction Season*				
	1 2013	2 2014	3 2015	4 2016	5 2017
Ruby 1	50 working days with 15-minute delays	50 working days with 15-minute delays			
Ruby 2		60–80 working days with 15-minute delays	60–80 working days with 15-minute delays		
Patrick Creek Narrows Location 1	20 working days with 5 to 20-minute delays	90–100 working days with 5 to 20-minute delays and shoulder closure	90–100 working days with 5 to 20-minute delays and shoulder closure	90–100 working days with 5 to 20-minute delays and shoulder closure	

Project Location (All Alternatives)	Construction Season*				
	1 2013	2 2014	3 2015	4 2016	5 2017
Patrick Creek Narrows Location 2	20 working days with 5 to 20-minute delays	150 working days with 5 to 20-minute delays	150 working days with 5 to 20-minute delays	150 working days with 5 to 20-minute delays	
Patrick Creek Narrows Location 3	20 working days with 5 to 20-minute delays	50–70 working days with 5 to 20-minute delays for 25 working days	50–70 working days with 5 to 20-minute delays for 25 working days	50–70 working days with 5 to 20-minute delays for 25 working days	
The Narrows		50 working days with 75-minute delays for 40 days	50 working days with 75-minute delays for 40 days	50 working days with 75-minute delays for 40 days	
Washington Curve		50–100 working days with 30-minute delays and night closures 50–100 days for Cut Slope Alternative	50–100 working days with 30-minute delays and night closures 50–100 days for either alternative	50–100 working days with 30-minute delays and night closures 50–100 days for either alternative	50–100 working days with 30-minute delays and night closures 50–100 days for Retaining Wall Alternative

\* A construction season typically extends from summer through fall. For the Patrick Creek Narrows locations, the season may extend into winter. Number of working days and estimated delays is approximate. Darker shading represents alternate construction year. Proposed delays are subject to approval by the Department's District 1 Lane Closure Committee, with the intent to minimize traffic delays on the route.

<sup>a</sup> A construction season typically extends from summer through fall. For the Patrick Creek Narrows locations, the season may extend into winter. Number of working days and estimated delays are approximate. Darker shading represents alternate construction year. Proposed delays are subject to approval by the Department's District 1 Lane Closure Committee, with the intent to minimize traffic delays on the route.

Under typical one-way reversible control, maximum delays of 15 to 30 minutes are anticipated; however, full road closures without detour could cause delays up to 1 hour during construction at the Narrows Location. Additionally, night closures of one to four hours at Washington Curve are anticipated for 50 to 100 days in 2014 and 2015 or 2016 and 2017. The full width of the traveled way would be open for use by public traffic on weekends (after 3:00 p.m. on Fridays), designated legal holidays, the day preceding designated legal holidays, and when construction operations are not actively in progress. Implementation of measures included in the community impact assessment would reduce the temporary access and circulation impacts of the proposed project (Trott 2010). These measures include coordinating construction improvements to minimize delays and providing the public with advance notice of closures or lengthy delays. Additional measures would be implemented as part of the approved location-specific traffic management plans for the proposed project, as described in Chapter 1 of the EIR/EA. As indicated in Table B-3, these delays could be inconvenient for visitors and would delay access to the recreational facilities along US 199 during the construction season. In particular, multiple delays could be encountered by visitors when construction is occurring at more than one location during the same construction season over a period of 4 years, which would affect accessibility to the area. These delays in access would be a temporary occupancy that interferes with the activities or purposes of the resource, but the duration of delays over 4 years would not satisfy one of the criteria in 23 CFR 774.13(d) for temporary occupancy, so the delays would result in a Section 4(f) use of the Smith River NRA.

Because of the temporary nature of construction, the anticipated traffic delays during construction were initially evaluated for the Smith River NRA as a whole relative to the

temporary occupancy criteria. Under FHWA regulations (23 CFR 774.13[d]), temporary occupancy of a property does not constitute use of a Section 4(f) resource when the following conditions are satisfied. As noted below, anticipated traffic delays would not satisfy the third criterion for temporary occupancy.

- **The duration of the occupancy must be temporary (i.e., less than the time needed for construction of the project), and there should be no change in ownership of the land.** The proposed project would be constructed during the construction season for up to 3 years on US 199, as indicated in Table B-3 (the maximum anticipated duration for construction at Patrick Creek Narrows Locations 1 to 3, the Narrows, and Washington Curve). However, there would be no change in ownership of the land. The project meets this temporary occupancy criterion.
- **The scope of work must be minor (i.e., both the nature and magnitude of the changes to the Section 4(f) property are minimal).** The proposed project involves improvements to the existing roadway, and there would be no changes to the Section 4(f) properties along US 199, the Smith River NRA, or designated recreation areas within the Smith River NRA. The project meets this temporary occupancy criterion.
- **There are no anticipated permanent adverse physical impacts, nor will there be interference with the protected activities, features, or attributes of the property, on either a temporary or permanent basis.** There would be no anticipated adverse physical impacts on the Smith River NRA on either a temporary or permanent basis. However, this criterion would not be met because the proposed project would affect accessibility to the recreation facilities located on US 199 during the construction season over a period of 3 years on US 199 (Table B-3).
- **The land being used must be fully restored (i.e., the property must be returned to a condition which is at least as good as that which existed prior to the project).** The proposed project involves improving the existing roadway, and there would be no changes to the Section 4(f) properties along US 199. The proposed project would remove all construction debris along the roadway, and disturbed areas would be restored to a natural setting with regrading, erosion control, and revegetation. The project meets this temporary occupancy criterion.
- **There must be documented agreement of the official(s) with jurisdiction over the Section 4(f) resource regarding the above conditions.** A letter requesting concurrence with these assertions from the Forest Service was prepared for submittal by the Department and was submitted on March 26, 2012. The concurrence letter was signed by the Forest Service on April 5, 2012 (see Chapter 4 of the EIR/EA).

The proposed project would interfere temporarily with public access to the recreation facilities within the Smith River NRA, based on the above assertions; however, the temporary period of construction would extend over a period of 4 years on US 199, with delays occurring at multiple locations along US 199. These delays would affect visitor access to the Smith River NRA recreation sites along US 199, including day-use areas, campgrounds, trailheads, and Middle Fork Smith River access points. The Department preliminarily determined that the delay in access to recreation areas within the Smith River NRA would be inconvenient enough to visitors that it would not meet the criteria for a temporary occupancy. Instead, it would constitute a

Section 4(f) use and would meet the requirements for a *de minimis* impact. The Department may make such a finding only if the project will have no adverse effect on the activities, features, and attributes of the Smith River NRA, and only if the Forest Service concurs with the *de minimis* finding. The Department designed the project to protect the activities, features, and attributes of the Smith River NRA and coordinated with the Forest Service to ensure that the project would have no adverse effects after including measures to minimize harm. Measures to minimize harm are described below in Section B5. After completion of the public and agency review process for the draft EIR/EA, the Department requested concurrence on March 26, 2012 from the Forest Service on the *de minimis* finding on the Smith River NRA. The concurrence letter was signed by the Forest Service on April 5, 2012 (see Chapter 4 of the EIR/EA).

### **Impacts to the Cut Slope Outside the Right-of-Way Easement**

Proposed construction on the rock cut slope at Patrick Creek Narrows Location 2, in an area that is just beyond the existing USDOT easement, would cause temporary impacts to the slope. Cut slope excavation at Patrick Creek Narrows Location 2 would not require permanent acquisition of Smith River NRA land, and the work within the NRA would be temporary. However, cutting the slope would require the removal of existing trees, vegetation, and the seed bank during excavation. This area is an existing rock/soil face, and no Forest Service recreation facilities are located therein. The area that would be excavated would extend outside the existing USDOT easement by approximately 0.23 acre up to 0.47 acre, as presented in the project description for this location. The Forest Service preliminarily suggested that the Department would not need to request a permanent expansion of the existing easement. No protected activities, features, or attributes for which the Smith River NRA is protected under Section 4(f), excluding the land itself, would be affected. The inability to fully restore the 0.23-0.47 acre of excavated rock cut slope just beyond the U.S. Department of Transportation's easement at Patrick Creek Narrows Location 2 would not meet the criteria for temporary occupancy. Instead, these would constitute a Section 4(f) use and meet the requirements for a *de minimis* impact. This conclusion is based on the fact that the excavation of the 0.23 to 0.47 acres of rock cut slope would not result in a permanent adverse effect on any of the recreation areas within the Smith River NRA. The DEIR/EA (i.e., discussions in the draft version of this letter in Section 4.3.2.2 and Appendix B) suggested that the Section 4(f) use would be *de minimis*, but that finding was based on the anticipated need to request an expansion of the USDOT easement to incorporate the 0.23 to 0.47 acre of rock cut slope that is currently on Forest Service land into the roadway right of way. Even though the Forest Service preliminarily suggested that the existing USDOT easement does not require expansion, the inability to fully restore the excavated rock cut slope to a condition which is at least as good as that which existed prior to the project leads the Department to the same preliminary finding that the proposed work constitutes a Section 4(f) use and meets the requirements of a *de minimis* impact. The Department may make such a finding only if the project will have no adverse effect on the activities, features, and attributes of the Smith River NRA and only if the Forest Service concurs with the *de minimis* finding. After completion of the public and agency review process for the draft EIR/EA, the Department requested and received concurrence from the Forest Service on the *de minimis* finding on the Smith River NRA.

## **B.4.2 Potential Impacts on Recreation Sites within the Smith River National Recreation Area**

Designated and developed recreation sites within the Smith River NRA located within a 0.5-mile radius of the project locations on US 199 are discussed below relative to the requirements of Section 4(f). The Section 4(f) resources discussed below include Sandy Beach, Patrick Creek Campground and Patrick Creek Trail, and Middle Fork Smith River Access Trails.

### **B.4.2.1 Sandy Beach**

The pullout used to access Sandy Beach is located just east of the eastern terminus of Patrick Creek Narrows Location 1 at PM 20.9 (Figure B-2). The beach is located more than 1,500 feet southeast of the proposed project on the banks of the Middle Fork Smith River. Construction activities at this site include increasing the existing curve radius and roadway widening on both sides of US 199. To accommodate the widening and broader roadway curves, an approximately 150-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. Additional roadway work may include paving, striping, shoulder backing, reconstructing existing guard rail, and constructing a new metal-beam guardrail. Construction at this location is anticipated to take approximately 90–100 working days over a period of two seasons, beginning in spring 2013 with initial clearing and grubbing. Construction at Patrick Creek Narrows Location 1 would not occur on weekends (after 3 p.m. on Fridays), designated legal holidays, and the day preceding designated legal holidays. As discussed above, traffic delays on US 199 could be inconvenient for day-use visitors traveling to and from Sandy Beach. However, no construction activities or construction staging areas for Patrick Creek Narrows Location 1 would take place on the paved pullout used to access the beach. In addition, the proposed project would not require additional right-of-way at this area on either a temporary or permanent basis. The beach area would still be accessible, and parking in the paved pullout would be maintained at all times during construction, although accessibility may be temporarily affected by traffic queues since the access is within the work area for Patrick Creek Narrows Location 1.

This day-use area was identified as a sensitive noise receiver in the noise study report prepared for the proposed project (ICF International 2010b). The noise study report estimated the beach area was located approximately 1,500 to 2,000 feet from the construction site. Existing short-term noise levels were measured at 55 A-weighted decibels<sup>3</sup> (dBA) with Middle Fork Smith River water flow as the primary source of noise. Estimated noise levels at a distance of 1,500 to 2,000 feet from construction activities were 50 to 56 dBA, which are similar to the existing noise levels measured in this location. Blasting and pile driving are not proposed at this location. Therefore, noise generated during construction is not expected to impair the use or enjoyment of the day-use area.

Sandy Beach is located more than 1,500 feet southeast of the proposed project on the banks of the river. Views of the construction activities on US 199 can be expected by recreationists at the

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<sup>3</sup> To approximate the response of the human ear, sound levels of individual frequency bands are weighted, depending on the human sensitivity to those frequencies. Then, an “A-weighted” sound level (expressed in units of dBA) can be computed based on this information.

beach during the construction period. However, these views would be temporary over a period of 90–100 days in 2014, 2015, or 2016. A retaining wall would be constructed in the fill slope below the roadway, in the existing rock armored bank, which is located on the river side of the roadway near the access point to the beach. This would increase the visual presence of the roadway from the beach. However, aesthetic treatments of the wall would be implemented to minimize the wall's visual intrusion by using construction materials with pattern, texture, and color similar to that which exists in the area, and using low-sheen and non-reflective surface materials to reduce the potential for glare. These measures are included in the visual impact assessment (ICF International 2010d) and Section 2.1.6.4, "Visual/Aesthetics," of the EIR/EA, and summarized in Section B.5 below. Construction of a retaining wall would change the existing views toward the roadway for recreationists on the beach but would not change the overall visual features of the scenic views of the river or canyon. Retaining walls are existing elements of the setting in the narrow Middle Fork Smith River canyon. This increase in the visual presence of the roadway at the beach would not interfere with the recreational use or enjoyment of the beach.

#### **B.4.2.2 Patrick Creek Campground and Patrick Creek Trail**

The Patrick Creek Campground and Patrick Creek Trail are located more than 0.5 mile north and west of the Narrows site. Although no construction would occur adjacent to the campground or trail, temporary construction impacts could occur, including intermittent noise impacts and traffic delays associated with blasting activities.

The Narrows site is situated between Patrick Creek Narrows Locations 1 and 2, with limits ranging from PM 22.7 to 23.0 (Figure B-2). Proposed improvements at the Narrows site would primarily include widening the roadway. In addition to roadway widening, isolated outcrops of overhanging or loose rock above the excavation limits would be stabilized. Roadway widening would be accomplished by cutting deeper into the existing cut slope; this work would involve drilling into the rock face and conducting controlled blasting in several places. Drilling, controlled blasting, and excavation would be completed with two or three setups per day, with each setup involving all three activities. Construction is anticipated to take approximately 50 days over two seasons during summer and fall beginning in 2014.

Controlled blasting activities would occur during daylight hours at a distance of more than 2,000 feet from the campground and trail. The noise study report prepared for the proposed project estimated blasting noise levels based on a conservative set of assumptions and predicted noise levels at various distances (ICF International 2010b). Short-term noise levels measured at the campground were 50 to 55 dBA, and the primary sources of noise were water flow and traffic on US 199. The peak noise level for sound from blasting at a distance of 2,000 feet was estimated to be 112 dBA. Sound from blasting would attenuate as a result of the distance between the blast site and the campground. Additional shielding would be provided by the topography that blocks the line of sight between the blast site and the campground. This would reduce the noise levels below the estimated 112 dBA. The results in the noise study report indicate that sound from blasting could range from "distinctly perceptible to strongly perceptible" (70–90 dBA) to "strongly perceptible to mildly unpleasant" (90–120 dBA) at the campground. However, given the distance from the blasting activities, the proximity of the campground to US 199 with existing sound from occasional heavy-truck passages, and the fact that blasting would be limited

to two or three isolated blasts per day, noise from blasting activities is not expected to impair the use or enjoyment of the campground, trail, or day-use area. Blasting at this site would occur during the daytime, and construction noise would not affect campers sleeping at night in the campground. Noise attenuation measures would be required to reduce the potential noise impacts on campers and trail users (ICF International 2010b). See Section B.5 for details of the attenuation measures.

According to the noise study report, there would be no impacts associated with vibration from the blasting activities at locations more than 250 feet from the proposed blast sites (ICF International 2010b). There would be no impacts on buildings or structures at the campground due to vibration because of the distance from the proposed blast sites.

The entrance to the campground would be maintained during construction. As discussed above, traffic delays on US 199 could be inconvenient for campers and day-use visitors traveling to and from the campground. The full width of the traveled roadway would be open on weekends (after 3 p.m. on Fridays), designated legal holidays, the day preceding designated legal holidays, and when construction operations are not actively in progress.

Views from the campground or trail toward US 199 are limited, and construction would occur at a distance of more than 0.5 mile from the campground. There would be no proximity impacts due to visual impacts.

#### **B.4.2.3 Middle Fork Smith River Access Trails**

The informal river access trails are not designated as recreational trails or actively managed by the Forest Service for recreation. The Eagle Eye Mine Trail is located at PM 23.1, more than 500 feet east of the eastern terminus of the Narrows site (at PM 23.0). There is a proposed staging area located at PM 23.15, more than 250 feet east of the access trail. The Cedar Rustic Trail is located more than 2,000 feet west of Patrick Creek Narrows Location 2 (starts at PM 23.92). No construction activities would occur at either of these locations, and use of these informal trails to access the river would not be affected. However, as discussed above, traffic delays on US 199 could be inconvenient for visitors traveling on US 199.

### **B.5 Measures to Minimize Harm to the Smith River NRA**

The Department designed the proposed project to protect the activities, features, and attributes of the Smith River NRA and coordinated with the Forest Service to ensure that the project would have no adverse effects after including measures to minimize harm. Measures to minimize harm to the Smith River NRA are presented below.

The following possible measures, among others, will minimize the temporary delay in access to recreation areas within the Smith River NRA along US 199, including day-use areas, campgrounds, trailheads, and Middle Fork Smith River access points. Further, these possible measures, among others, will also be implemented at all project locations, including sites on SR 197, and will minimize temporary construction delays and temporary access and circulation

impacts on visitors and motorists traveling to the Smith River, Jedediah Smith Redwoods State Park, and Ruby Van Deventer County Park.

- Implementation of the project specific TMPs and the measures they contain would minimize the construction delays and temporary access and circulation impacts during construction of the proposed project. Measures contained in the TMPs relevant to notifying motorists and recreationists include maintaining access to side roads and residences; providing advance notification to emergency services that may be affected by lane closures; providing advance notification of closures or delays to adjacent residents, businesses, and landowners, including the Forest Service; contacting the Oregon Department of Transportation 2 weeks in advance of planned closures on US 199 in order to warn motorists of possible delays; coordinating closures with local and regional transit systems; and using Department advisory radios and changeable signs. This list is not all-inclusive, see the complete text of the measures included in the TMPs in Appendix G, "Traffic Management Plans," of the DEIR/EA and FEIR/EA.
- Additional measures that would further reduce these impacts include providing the public with advance notice of closures or lengthy delays on US 199 by using regional media (e.g., newspapers and radio stations) and a project website, and coordinating with other construction projects undertaken by the Department or other agencies to minimize delays. The full text of the measures appears under "Implement Additional Measures to Reduce Temporary Access and Circulation Impacts" in Section 2.4.3, "Community Impacts," of the DEIR/EA and FEIR/EA.
- During construction, access will be maintained to recreation sites on or accessed from US 199 and SR 197, including day-use areas, campgrounds, trailheads, and the Smith River and Middle Fork Smith River access points to maintain availability of recreational opportunities during construction.
- Construction will not occur on weekends (i.e., beginning after 3 p.m. on Fridays), designated legal holidays, or the day preceding designated legal holidays, thereby reducing impacts on parks and recreationists during these peak use periods.
- Noise and ground vibration control measures will be implemented to reduce the temporary impacts from construction noise at all project locations, and from controlled blasting at Patrick Creek Narrows Location 2 and the Narrows site. The full text of the measures is provided under "Employ Noise and Vibration Reducing Construction Practices by Implementing Noise and Vibration Control Measures" in Section 2.4.11, "Noise and Vibration," of the DEIR/EA and FEIR/EA.
- Measures to control airblast and ground vibration include reducing the quantity of explosive; modifying the confinement of explosive energy; modifying the powder factor; timing and spatial distribution of blasts; and using alternative methods such as high pressure gas methods to split rock.
- Measures to minimize temporary noise impacts from construction equipment include using effective sound-control devices on all equipment; changing the location of stationary construction equipment away from sensitive receptors as possible; turning off idling equipment; rescheduling construction activity during the daytime and/or a season that has the least impact on sensitive receptors; notifying adjacent residents in advance of construction work; installing acoustic barriers around stationary construction noise sources; scheduling

substantial noise-generating activity during daytime hours, where feasible; and designating construction staging areas as far as practical from sensitive receivers that are likely to fall within the higher ranges of ground and air vibrations from construction work..

The following measures will be implemented to maximize project aesthetics and minimize visual impacts in the project area at all project locations. These measures include the following.

- The Department, or its contractor, will follow the measures for permanent enhanced erosion control seeding and revegetation, as listed in Section 2.3.1.3, “Avoidance, Minimization, and/or Mitigation Measures for Natural Communities” in the Biological Environment section. Following those proposed measures would ensure seeding and revegetation that reflect natural existing vegetation patterns and provide multiple canopy layers, seasonality, diverse habitat, and reduced susceptibility to disease.
- Specific measures to reduce the visual impact of cut slopes, retaining walls, bridge aesthetics, and physical features associated with the construction of the roadway include coordinating with the Forest Service and the public to create a design that improves appearances of walls and bridges; maximizing slopes and reducing cut surface areas to reduce visual impacts of cut slopes; referring to local reference sites within 30 miles of the project area for design and construction treatments to reduce visual impacts; including the evaluation of steeper cut slopes to reduce wall area; evaluation of flatter toes at cut slopes to provide area for rock fall instead of using a retaining structure; considering using redwood soldier pile retaining walls; and mimicking aesthetics from local historical bridges within the new bridge design to lessen impacts on visual resources. The full text for this measure is provided under “Implement Best Management Practices for Project Design and Construction” in Section 2.1.6.4, “Visual/Aesthetics,” of the EIR/EA.
- To reduce the potential for glare, retaining walls will be constructed with construction materials with pattern, texture, and color similar to that which exists in the area and using low-sheen and non-reflective surface materials. The finish would be matte and roughened. The use of smooth, toweled surfaces and glossy paint would be avoided. This measure is included under “Construct Walls with Low-Sheen and Non-Reflective Surface Materials” in Section 2.1.6.4, “Visual/Aesthetics,” of the EIR/EA.

Measures to reduce the temporary air quality impacts, such as diesel fumes and dust on recreationists during construction, will be implemented at all project locations. These measures are included in the Department’s Standard Specifications and in the following provisions. For further information, see Section 2.4.10, “Air Quality.”

- 2006 Amendments to Standard Specifications Section 14-9.01—Air Pollution Control
- 2006 Amendments to Standard Specifications Section 14-9.02—Dust Control
- 2006 Standard Specifications Section 7-1.01F—Air Pollution Control
- 2006 Standard Specifications Section 10—Dust Control
- 2006 Standard Specifications Section 18—Dust Palliative
- 2006 Standard Special Provision S5-750 Naturally Occurring Asbestos
- 2006 Standard Special Provision 19-910 Material Containing Naturally Occurring Asbestos
- 2010 Standard Specifications Section 14-9.02—Air Pollution Control
- 2010 Standard Specifications Section 14-9.03—Dust Control
- 2010 Standard Specifications Section 18—Dust Palliative
- 2010 Standard Special Provision 14-11.05 Naturally Occurring Asbestos
- 2010 Standard Special Provision 49-1.03 includes provisions for management of naturally occurring asbestos during pile installation

Additional avoidance, minimization, and/or mitigation measures are included in the Human, Physical, and Biological Environment sections in Chapter 2 of the EIR/EA.

## **B.6 Coordination for Section 4(f) Resources**

Consultation and coordination with the agencies with jurisdiction over the Section 4(f) resources described in this document and other interested parties are complete. The relevant Section 4(f) resources and their respective agencies are listed below:

- Coordination with the National Park Service as required by the Wild and Scenic Rivers Act was initiated for the main stem of the Smith River and has been completed with regard to the proposed improvements at the two project locations along SR 197. A letter was received from the National Park Service in February 2010 stating that construction of the proposed project at the Ruby 1 and Ruby 2 sites would not have a direct and adverse effect on the values for which the Smith River was designated. A copy of this letter is included in Chapter 4 of the EIR/EA.
- Coordination with the Forest Service was initiated. A letter was sent on March 26, 2012 requesting concurrence with the *de minimis* impact finding on the Smith River NRA and the temporary occupancy of the Middle Fork Smith River and potential effects on the Middle Fork Smith River as required by the Wild and Scenic Rivers Act. Written concurrence was obtained from the Forest Service after the public was afforded an opportunity to review and comment on the effects of the proposed project and was received on April 5, 2012. A copy of this signed letter is included in Chapter 4 of the EIR/EA.
- Coordination with the Del Norte County Parks Department was initiated. A letter was sent on February 28, 2012 regarding the temporary construction easement at Ruby Van Deventer County Park. Written concurrence was obtained from the Del Norte County Parks Department on April 26, 2012. A copy of this letter is included in Chapter 4 of the EIR/EA.

## **B.7 Concluding Statement for the Smith River NRA**

Based on this analysis, the Department preliminarily determined that the proposed improvements along the US 199 alignment on national forest system lands would meet the requirements for a Section 4(f) use, *de minimis* impact on the Smith River NRA. The *de minimis* impact would result because of the potential for delays in access to the recreation facilities over a 3-year construction period at multiple sites on US 199 and the inability to fully restore the excavated rock cut slope at Patrick Creek Narrows Location 2 to a condition which is at least as good as that which existed prior to the project. The Department designed the project to protect the activities, features, and attributes of the Smith River NRA and coordinated with the Forest Service to ensure that the project would have no adverse effects after including the measures to minimize harm in Section B.5.

The proposed project would not require a permanent use of land from Sandy Beach, the Patrick Creek Campground, the Patrick Creek Trail, or the Middle Fork Smith River Access Trails. In addition, the proposed project would not cause a constructive use of Sandy Beach, the Patrick Creek Campground, the Patrick Creek Trail, or the Middle Fork Smith River Access Trails because the proximity impacts would be temporary and would not substantially impair the protected activities, features, or attributes of these recreation resources.

## **B.8 Other Park, Recreational Facilities, Wildlife Refuges, and Historic Properties Evaluated Relative to the Requirements of Section 4(f)**

This section of the document discusses parks, recreational facilities, wildlife refuges, and historic properties found within or adjacent to the project area that do not trigger Section 4(f) protection either because: 1) they are not publicly owned, 2) they are not open to the public, 3) they are not eligible historic properties, 4) the project does not permanently use the property and does not hinder the preservation of the property, or 5) the proximity impacts do not result in constructive use. Specifically, this section discusses Ruby Van Deventer County Park, Jedediah Smith Redwoods State Park, and the Smith River Wild and Scenic River System (Smith River and Middle Fork Smith River).

### **B.8.1 Ruby Van Deventer County Park**

#### **B.8.1.1 Description**

Ruby Van Deventer County Park, an 11.6-acre park is located near PM 4.5 along SR 197 (4705 North Bank Road). The park is owned by Del Norte County and managed by the Del Norte County Parks Department.

The heavily wooded park is situated on the banks of the Smith River, on the west side of SR 197 (Figure B-8). The park provides 18 public campsites and one group picnic area, with a camping fee of \$10 per night and a day-use fee of \$5. A group picnic site can be reserved for a fee of \$25

per day. The park is open year-round and offers swimming, boating, and fishing opportunities along the banks of the Smith River. A parking lot is situated immediately adjacent to and north of the park entrance off SR 197. The campground and picnic area are located on the bank of the Smith River, just north of the parking area between the river and SR 197. The campground and picnic area are accessed from the north end of the parking lot. Although the park property extends south approximately 0.5 mile along the banks of the river, there are no developed facilities south of the entrance to the park.

The western side of the parking lot also provides access to the banks of the Smith River. This access is not a developed boat ramp, but it is occasionally used as a drift boat put-in, and recreationists are able to drive boat trailers to the Smith River shoreline at this location (Fulton pers. comm.). Launching boats from this location can be difficult because of a large gravel sandbar in the river; as a result, this access to the river is not used very often (Fulton pers. comm.). Another public boat launch is located approximately 5 miles downstream from this location, and this location is reportedly used more frequently for boat launching than the informal, undeveloped put-in at the park (Fulton pers. comm.). Access to the river for recreational activities is available along the banks of the river within the park.

### **B.8.1.2 Evaluation Relative to Requirements of Section 4(f) for Ruby Van Deventer County Park**

Ruby Van Deventer County Park is a publicly owned park eligible for protection under Section 4(f). Ruby Van Deventer County Park is located adjacent to the Ruby 1 site at PM 4.5. The Department owns 40 feet of right of way along the proposed project area, adjacent to Ruby Van Deventer County Park. One design alternative is being considered for the Ruby 1 site, which includes roadway and shoulder widening. Ruby Van Deventer County Park is located immediately adjacent to SR 197 on the west (Figure B-8). The entrance to the park is located on the west side of SR 197 immediately adjacent to the southbound lane at the Ruby 1 site. Improvements at this site would lengthen the curve of the road and increase the width of shoulders. On the southbound side, the new shoulder width would vary from 0 to 4 feet, transitioning from each end of the project limits. Four-foot shoulders are proposed on the northbound side. All work on the southbound side of the highway would occur within the Department's existing right-of-way, except at the entrance to the park. Implementation of improvements at the Ruby 1 site would not require the acquisition of permanent right-of-way from Ruby Van Deventer County Park, but it would require a temporary construction easement. Details of the temporary construction easement are presented below under "Temporary Occupancy during Construction."

#### ***Potential Proximity Impacts during Construction for Ruby Van Deventer County Park***

Construction at the Ruby 1 site would not occur on weekends (after 3 p.m. on Fridays), designated legal holidays, or the day preceding designated legal holidays. In addition, night work is not anticipated at this site.

Views of the construction activities on SR 197 would be temporary during the construction period. These temporary views would not affect the use and enjoyment of the park or campsites because views toward SR 197 from the park and campsites are limited due to the vegetation and

coast redwood forest separating the river from the roadway. There are direct views of SR 197 from locations within the park and campsites exist. Removal of trees or vegetation would not occur in this area.

Implementation of the proposed improvements at the Ruby 1 site could generate exhaust and dust that may temporarily affect the experience of campers and visitors to the park during the construction period. Implementation of Department Standard Specifications and additional mitigation measures recommended in the air quality study report would minimize these potential effects during the construction period (ICF International 2010c). These measures are summarized above in Section B.5. Construction activities at the Ruby 2 site would not generate exhaust or dust that could affect the visitors to the southern portion of the park.

The northern terminus of the Ruby 2 site is located approximately 0.43 mile south of the Ruby 1 site, and Ruby Van Deventer County Park is located within 0.5 mile of the Ruby 2 site (Figure B-8). The Ruby 2 site is located between approximately 400 and 580 feet west of the southern portion of the park. Three alternatives were considered at this site to improve the existing roadway curve, superelevation, and width (see Chapter 1 of the DEIR/EA and FEIR/EA and Section B.2.2.2, above). After review of public comments on the DEIR/EA and coordinating with resource agencies, and in order to avoid the significant impact of cutting large, old redwood trees that would have occurred under the other two alternatives, the Department selected the Two-Foot Widening in Spot Locations Alternative as the preferred alternative for this location. Construction activities at this location would not require acquisition of temporary or permanent right-of-way from Ruby Van Deventer County Park. As stated above, there are no park facilities south of the entrance to the park.

Access to the park would not change and would be maintained at all times during construction at both proposed project locations on SR 197. However, construction-related activities on SR 197 could intermittently delay motorists traveling to the park. The maximum delays expected at the Ruby 1 and Ruby 2 locations would be up to 15 minutes. Improvements at both Ruby 1 and 2 locations would be completed over one construction season at each site. Construction is anticipated to begin at Ruby 1 in 2013 or 2014 and at Ruby 2 in 2014 or 2015.

Because the park is adjacent to SR 197, noise from traffic on the roadway is an existing condition for visitors to the park. However, noise generated during the construction period could temporarily affect visitors to the park, in particular campers in sites located closest to the Ruby 1 site. The closest campsites are located approximately 50 to 100 feet away from the proposed construction site and have a direct or partial line of sight toward SR 197. Noise studies conducted for the proposed project measured the existing noise level near the entrance to Ruby Van Deventer County Park at PM 4.5 at 60 dBA, and identified the primary noise source as traffic on SR 197 (ICF International 2010b). Because the campsites are located north of the entrance, construction noise levels at the campsites are anticipated to be somewhat less than those at the entrance. However, the noise studies also indicate that at a distance of 50 feet from the construction equipment, maximum noise levels during construction periods could range from 88 to 92 dBA (ICF International 2010b). Blasting and pile driving would not occur at this site, but noise levels generated during construction could be disruptive to campers who are in the campsites closest to the Ruby 1 site during day time construction hours. However, night work is not anticipated at this site and construction noise would not affect campers sleeping at night in

the campground. Construction at the Ruby 1 site would not occur on weekends (beginning after 3 p.m. on Fridays), designated legal holidays, or the day preceding designated legal holidays. Therefore, noise generated during construction would be temporary and is not expected to impair the use or enjoyment of the campsites at Ruby Van Deventer County Park.

The southern portion of the park is located more than 400 feet west of the northern terminus of the Ruby 2 site. Existing noise levels were not measured at the southern portion of the park, but given the distance from the road, it is assumed that noise generated from traffic on SR 197 would be less than that measured near the park entrance, 60 dBA. In this part of the park, the primary noise source is more likely from water flow than traffic noise. The noise studies indicate that at a distance of 50 feet from the construction equipment, maximum noise levels during construction periods could range from 88 to 94 dBA at this location (ICF International 2010b). Noise generated during construction is expected to decrease by approximately 7 to 8 dBA per doubling of distance (ICF International 2010b) which would reduce construction noise to the range of approximately 64 to 70 dBA at this area within the park. This area of the park is limited to day use only and is not used for camping. Visitors to this area of the park would be fishing, swimming or kayaking where construction noise could be heard over waterflow of the river, however it is not anticipated that the construction noise would interfere with the enjoyment of these activities. Therefore, noise generated during construction at the Ruby 2 site is not expected to impair the use or enjoyment of the southern portion of the park.

### **Temporary Occupancy during Construction of Ruby Van Deventer County Park**

Implementation of this alternative would not require the acquisition of permanent right-of-way from Ruby Van Deventer County Park, but it would require a temporary construction easement. The temporary construction easement would be located on park property within the parking lot (Figure B-9). The temporary construction easement is necessary to allow for modification of the park entrance to match the improved roadway surface elevation. Parking on three to four parking spaces would not be available during the time it takes to modify the entrance to the park. According to Del Norte County, the Department has used the parking area on previous occasions when working in the vicinity (Fulton pers. comm.; Renae pers. comm.).

The temporary construction easement would be located on one parcel of park property west of SR 197 (Assessor's Parcel Number [APN] 105-130-22) (Trott 2010). The temporary construction easement would include a total area of approximately 5,600 square feet (0.13 acre) (Figure B-9). The temporary construction easement would extend into the paved parking lot immediately north of the entrance and would affect up to four parking spaces (Figures B-9 and B-10).

The temporary construction easement would extend into the parking lot to allow for the transition in elevation between the roadway and entrance. Construction at the entrance is anticipated to occur over a period of 3 days. Access to the park, including the campground and picnic area, would be maintained at all times during construction at the park entrance and during the anticipated 50-day construction period at this location. The construction period at the Ruby 1 site is anticipated to occur summer through fall 2012 or 2013 (California Department of Transportation 2007a). The temporary construction easement would be located at the entrance extending into the parking lot closest to the entrance, but would not extend into the campground or picnic area. Establishment of the construction zone would be done in a manner that would

minimize the area unavailable for parking and would not temporarily or permanently displace any campsites or picnic sites.

The temporary construction easement would temporarily prohibit visitor parking on up to four parking spaces; however, this area would be sited to minimize the area unavailable for parking. The parking lot is approximately 85 feet long by 55 feet wide, a total area of 4,675 square feet (0.11 acre), and has 18 marked parking spaces (Renae pers. comm.). Because of the short-term nature of the displacement (3 days) and the fact that construction would occur during the week, not on weekends, the loss of the use of the four parking spaces would not disrupt use of the park or river access by day-use recreationists.

Access to the river at the undeveloped boat launch by boaters with trailers could be reduced or limited during the period required for the temporary construction easement because there would be less room to maneuver boat trailers in the parking lot. However, this access would not be blocked and would be maintained at all times, and access to the river by other recreationists at this location would not be affected. Additionally, construction activities at the entrance could intermittently delay access to the campsites and day-use area at times when equipment or material is moving in or out of entrance. However, access to the campsites and day-use area of the park would be maintained at all times during construction activities.

Under FHWA regulations (23 CFR 774.13[d]), temporary occupancy of a property (i.e., Ruby Van De Venter County Park) does not constitute use of a Section 4(f) resource when the following conditions are satisfied:

- **The duration of the occupancy must be temporary (i.e., less than the time needed for construction of the project), and there should be no change in ownership of the land.** The temporary construction easement proposed at Ruby Van Deventer County Park would be temporary for an anticipated period of 3 days of the 50-day construction period for this location. Once construction has been completed at this site, full use of the entrance and parking lot for visitors would resume. The construction easement would be temporary, compared with the overall construction period of the proposed improvements at this location, and construction activities would not require a change in ownership of the park lands. The project meets this temporary occupancy criterion.
- **The scope of work must be minor (i.e., both the nature and magnitude of the changes to the Section 4(f) property are minimal).** Construction activities in the area would allow for modification of the park entrance to meet the elevation of the improved roadway. The entrance would be paved to transition from SR 197 to the parking area. A temporary construction zone would be established around the area in the parking lot, with limited access for equipment and workers to pave the area. No other physical changes to the parking lot or other park property are anticipated. Removal of trees or vegetation would not be required in this area. The project meets this temporary occupancy criterion.
- **There are no anticipated permanent adverse physical impacts, nor will there be interference with the protected activities, features, or attributes of the property, on either a temporary or permanent basis.** No permanent adverse physical impacts on the park property are anticipated as a result of the modifications to the park entrance. The Department coordinated with the Del Norte County Parks Department to ensure that, to the

extent feasible, construction would avoid impacts on as many park visitors as possible. This coordination also ensured that access to the park, river access, and visitor use of the campsites and day-use areas would continue uninterrupted during the construction period at the Ruby 1 site. Potential intermittent delays on SR 197 near the park are not expected to interfere with the protected activities, features, or attributes of the park. Once construction has been completed, use of the entrance and parking lot would resume. The project meets this temporary occupancy criterion.

Access to the river at the undeveloped boat launch by boaters with trailers could be less convenient during the estimated 3 days it would take to modify the entrance because there would be less room to maneuver boat trailers in the parking lot. However, this access would not be blocked and would be maintained at all times, and access to the river by other recreationists at this location would not be affected. Launching boats from the informal, undeveloped boat launch is difficult because of the large gravel sandbar; therefore, use of the undeveloped boat launch is infrequent or occasional. Because of the short-term nature of this temporary impact, the existing difficulty of launching boats from this location, and the availability of other boat launch facilities nearby, the temporarily reduced or limited area that boaters with trailers would have to maneuver in the parking area is not expected to interfere with the protected activities, features, or attributes of the park. The construction at the park entrance would not result in a permanent interference with the use of the river access for boaters with trailers. The project meets this temporary occupancy criterion.

- **The land being used must be fully restored (i.e., the property must be returned to a condition which is at least as good as that which existed prior to the project).** Construction activities would take place at the entrance to the park, and there would not be any physical changes to other park property. Removal of trees or vegetation would not be required on park property for the construction activities. The entrance would be paved and fully restored to a condition as good as that which existed before the proposed project. The entrance would be restriped. However, should any modifications or inadvertent damage occur to the parking lot or other park property, the property would be restored, at a minimum, to the condition that existed before the construction activities. The project meets this temporary occupancy criterion.
- **There must be documented agreement of the official(s) with jurisdiction over the Section 4(f) resource regarding the above conditions.** A letter requesting concurrence from the Del Norte County Parks Department was submitted on February 28, 2012 by the Department. Written concurrence was obtained from the Del Norte County Parks Department on April 26, 2012 (see Chapter 4 of the EIR/EA).

As described above, the temporary occupancy of Ruby Van Deventer County Park would meet all the criteria outlined in 23 CFR 774.13(d) for temporary occupancy. Coordination with the Del Norte County Parks Department provided an additional opportunity for the county to review and comment on the temporary construction easement and potential impacts at Ruby Van Deventer County Park.

### **B.8.1.3 Findings for Ruby Van Deventer County Park**

The proposed project at the Ruby 1 and 2 sites would not constitute a use of Section 4(f) property because it would not require acquisition of permanent right-of-way from the parklands. Therefore, the provisions of Section 4(f) would not be triggered.

The proposed project at the Ruby 1 and 2 sites would not cause a constructive use of Ruby Van Deventer County Park because the proximity impacts would be temporary and would not substantially impair the protected activities, features, or attributes of Ruby Van Deventer County Park. Therefore, the provisions of Section 4(f) would not be triggered.

Further, the temporary occupancy of Ruby Van Deventer County Park for construction at the Ruby 1 site would meet all of the temporary occupancy criteria outlined in 23 CFR 774.13(d). Therefore, the provisions of Section 4(f) are not triggered.

### **B.8.2 Jedediah Smith Redwoods State Park**

#### **B.8.2.1 Description**

Jedediah Smith Redwoods State Park was established in 1929 and is located within the Redwood National Park. The 10,000-acre Jedediah Smith Redwoods State Park is located 9 miles east of Crescent City. US 199 meanders through the park for about 4 miles between its western boundary near Kings Valley Road and its eastern boundary at the Hiouchi Bridge near the US 199/SR 197 intersection (Figure B-2). This park, along with Prairie Creek Redwoods State Park, Del Norte Coast Redwoods State Park, and Redwood National Park, are managed cooperatively by the National Park Service and California Department of Parks and Recreation. The combined 105,516 acres of parkland are designated “Redwood National and State Parks” and contain 36% of California’s old-growth redwood forest (California Department of Parks and Recreation 2009). The old-growth redwood forests within Jedediah Smith Redwoods State Park are designated as a world heritage site and international biosphere reserve (UNESCO World Heritage Centre 2009).

The main access to Jedediah Smith Redwoods State Park is from US 199; there is limited access from SR 197. A visitor center is located on Kings Valley Road at the eastern boundary of the park, near Hiouchi, just off US 199. The Smith River and Mill Creek flow through the park, providing river access and fishing opportunities. Jedediah Smith Redwoods State Park has more than 20 miles of hiking and nature trails that meander through the redwood forest, including the Stout Grove, Boy Scout Tree, and Mill Creek Trails (Baselt 2009). These trails are located west of the Smith River. The park provides more than 106 recreational vehicle and tent camping sites, with developed camping amenities at each campsite. The campground is located near the visitor center (California Department of Parks and Recreation 2009). The park’s peak visitor season is Memorial Day through Labor Day.

### **B.8.2.2 Evaluation Relative to Requirements of Section 4(f) for Jedediah Smith Redwoods State Park**

Jedediah Smith Redwoods State Park is a publicly owned park eligible for protection under Section 4(f). The Ruby 2 site is located on SR 197 between PM 3.2 and PM 4.0, 0.5 mile south of the Ruby 1 site (Figures B-1, B-2, and B-8). Jedediah Smith Redwoods State Park is located within the 0.5-mile radius of the Ruby 2 site, just south of the project terminus at PM 3.2 (Figure B-2). Three build alternatives were proposed at this location to widen the shoulders on both sides of SR 197 and increase the curve radii (see Chapter 1 of the DEIR/EA and FEIR/EA and Section B.2.2.2, above). After review of public comments on the DEIR/EA and coordinating with resource agencies, and in order to avoid the significant impact of cutting large, old redwood trees that would have occurred under the other two alternatives, the Department selected the Two-Foot Widening in Spot Locations Alternative as the preferred alternative for this location. The number of construction working days at the Ruby 2 site is anticipated to be approximately 60-80 days (approximately 12-16 weeks) under the Two-Foot Widening in Spot Locations Alternative, with work completed over one construction season in summer/fall 2013 or 2014. Roadway widening activities would require the acquisition of right-of-way along the roadway frontage from several private property owners on both the west and east sides of the roadway.

#### ***Potential Proximity Impacts during Construction for Jedediah Smith Redwoods State Park***

The northern boundary of the state park is approximately 300 feet south of the Ruby 2 site (Figures B-2 and B-8). However, no construction activities at the Ruby 2 site would occur on state-owned parklands, and the proposed project would not require acquisition of right-of-way from the parklands on either a temporary or permanent basis. Access from SR 197 to the northern portion of the park is via dirt roads and leads to private in-holdings within the park (California Department of Parks and Recreation 2009). There are no public trails, campgrounds, or other park facilities located within 1 mile of the Ruby 2 site.

The main portion of the state park is located more than 1 mile southwest of the Ruby 2 site and across the Smith River. Because of the distance of the recreation facilities at Jedediah Smith Redwoods State Park from SR 197 and the Ruby 2 site, there would be no proximity impacts due to noise or visual impacts.

Construction-related activities could delay traffic on SR 197. However, substantial traffic delays or conflicts are not anticipated from construction activities at these sites. Construction at either site may or may not occur during the same construction season, traffic controls would include temporary one-way reversible traffic control, and estimated maximum traffic delays would be 15 minutes per location. Because most park users access Jedediah Smith Redwoods State Park from US 199, the minor traffic delays on SR 197 would have a minor effect on park visitors. Before construction of project improvements each construction season, contact would be made with Jedediah Smith Redwoods State Park staff to advise them of the potential length and timing of any closures on US 199 and to determine the exact dates of any festivals in the park that might be affected by the closures.

### **B.8.2.3 Findings for Jedediah Smith Redwoods State Park**

The proposed project at the Ruby 2 site would not require a permanent or temporary use of parklands because the nearest project component is approximately 300 feet from the northernmost portion of the park. In addition, the proposed project at the Ruby 2 site would not cause a constructive use of Jedediah Smith Redwoods State Park because the proximity impacts would be temporary and would not substantially impair the protected activities, features, or attributes of Jedediah Smith Redwoods State Park. Therefore, the provisions of Section 4(f) would not be triggered.

### **B.8.3 Smith River Wild and Scenic River System**

#### **B.8.3.1 Description**

The Smith River is part of the National Wild and Scenic Rivers System, a federal system created by Congress to recognize and protect rivers across the country. More than 300 miles of the Smith River system are designated as a Wild and Scenic River, a longer stretch than any other river in the United States. The Smith River is also undammed, for its entire length, making it the only major river system in California without dams. Of the 325.4 miles of Wild and Scenic River designation along the Smith River, 78 miles are wild, 31 miles are scenic, and 216.4 miles are classified as recreational. The Smith River Wild and Scenic River system was designated in January 1981 and redesignated in November 1990 with creation of the Smith River NRA (National Wild and Scenic Rivers 2009).

The Smith River Wild and Scenic River system is also part of the California Wild and Scenic Rivers System and the National Wild and Scenic Rivers System. The main stem of the Smith River from the confluence of its Middle Fork and South Fork up-river to the boundary of the Six Rivers National Forest is federally designated as recreational. Below this point, the main stem is a state-designated recreational river to its mouth at the Pacific Ocean. Within the Six Rivers National Forest jurisdiction, Wild and Scenic Rivers are managed by the Forest Service. Outside of the Six Rivers National Forest jurisdiction, Wild and Scenic Rivers are managed by the National Park Service.

The Middle Fork Smith River is federally and state-designated as recreational from its confluence with Knopki Creek to its confluence with the South Fork Smith River. The Wild and Scenic Rivers Act (16 USC 1271–1287) defines recreational rivers as “those rivers or segments of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.” The California Public Resources Code (PRC) includes the same definition in Sections 5093.54 et seq. The primary value for which the Smith River was designated is its “outstanding remarkable” anadromous fishery; secondary factors of the designation are its notable recreational and scenic values (USDA Forest Service 2005).

Within the project area, the main stem of the Smith River parallels SR 197, and the Middle Fork Smith River borders the project area along US 199 (Figures B-2, B-4, and B-8). In addition, the

following tributaries in the project area are also designated as part of the Wild and Scenic Rivers system:

- Monkey Creek (recreational) from its headwaters in the northeast quadrant of Section 12 T18N R3E, as depicted on the 1951 U.S. Geological Survey (USGS) 15-degree Gasquet topographic map, to its confluence with the Middle Fork Smith River.
- Patrick Creek (recreational) from the junction of the east and west forks of Patrick Creek to the confluence with the Middle Fork Smith River.
- Kelly Creek (scenic) from its source in Section 32 T17N R3E, as depicted on 1951 USGS 15-degree Gasquet topographic map to the confluence with the Middle Fork Smith River.

In addition, the Siskiyou Fork Smith River is federally and state-designated as a recreational river from its confluence with the South Siskiyou Fork Smith River to its confluence with the Middle Fork Smith River.

Within the Smith River NRA, Wild and Scenic Rivers are managed by the Forest Service, and the Smith River NRA management plan serves as the management plan that satisfies the requirements of the Wild and Scenic Rivers Act (16 USC 1271–1287). State-designated rivers are also protected under the California Wild and Scenic Rivers Act (PRC 5093.50 et seq.). The California Resources Agency is responsible for coordinating activities of state agencies that may affect these designated rivers.

Streamside protection zones are established for the designated river and stream segments where removal of trees within the protection zones may only occur “when necessary for human health and safety, to maintain trails or existing roads, for the development of recreation and other facilities, for the protection of the recreation area in the event of fire, or to improve fish and wildlife habitat” (USDA Forest Service 1992).

### **B.8.3.2 Evaluation Relative to Requirements of Section 4(f) for the Smith River Wild and Scenic River System**

Section 4(f) applies to portions of Wild and Scenic Rivers that are publicly owned and designated recreational, such as the segments of the Smith River Wild and Scenic River system. As stated above, segments of the Smith River along SR 197 and the Middle Fork Smith River along US 199 are designated as recreational rivers, qualifying both segments for protection under Section 4(f).

Designated recreational river segments allow for transportation facilities, such as SR 197 and US 199. Highway improvements on US 199 were provided for in the Smith River NRA when it was established, and the river was designated with these existing transportation facilities. In fact, US 199 is the primary access to recreation opportunities along the Middle Fork Smith River within the Smith River NRA. The proposed project does not involve permanent construction in the bed or on the banks of the main stem of the Smith River (below the ordinary high water mark [OHWM]), and it is not considered to be a water resources project subject to review under Section 7 of the Wild and Scenic Rivers Act (16 USC 1271–1287). The OHWM is an important limit because permanent construction below the OHWM could adversely affect the values for

which the river was designated. Only one proposed project location, Patrick Creek Narrows Location 2, along US 199 would include proposed work in the channel of the Middle Fork Smith River. Work at this location under the selected preferred alternative, the Downstream Bridge Replacement Alternative, would extend below the OHWM but would stay above the wetted channel, so that there will be no in-water work. Improvements at this location are discussed below. All other requirements of the Wild and Scenic Rivers Act must be satisfied, independent of the Section 4(f) approval (23 CFR 774.11[g]). See the “Wild and Scenic Rivers” section in Section 2.1.1 of the EIR/EA.

The two segments of the Smith River Wild and Scenic River system within the project area are discussed below. Recreational opportunities within the project area primarily include camping, fishing, hiking, whitewater boating, swimming, naturalist pursuits, and photography.

### **Smith River (Main Stem)**

The Smith River is located within the 0.5-mile radius of two project locations: Ruby 1 and 2 (Figure B-8). Proposed improvements at both locations include widening the roadway and increasing the curve radii. The Ruby 1 site is located closest to the river at Ruby Van Deventer County Park (Figure B-9), but no construction activities would take place on the banks of the river, 50 feet or more west of the roadway. As shown in Figure B-8, the Ruby 2 site is located 200 feet or more from the river. The proposed project at the Ruby 1 and 2 sites does not involve construction in the bed or on the banks of the river on either a temporary or a permanent basis.

Construction at the Ruby 1 and 2 sites would not occur on weekends (beginning after 3 p.m. on Fridays), designated legal holidays, or the day preceding designated legal holidays. No night work is anticipated at either site. The approximate construction duration at the Ruby 1 site is 50 days, and between 60 and 80 days at the Ruby 2 site. The maximum traffic delays expected on SR 197 would be 15 minutes per location. Improvements at the Ruby 1 and 2 sites would be completed in one construction season at each site. The target year for construction at the Ruby 1 site is summer through fall 2013 or 2014. The target year for construction at the Ruby 2 site is summer through fall 2014 or alternatively in summer through fall 2015.

Views from the river toward SR 197 are limited because of the vegetation and coast redwood forest separating the river from the roadway. Views of the existing roadway are occasional, and this would not change during construction. No impacts on visual resources that would affect the use or enjoyment of the river for recreational purposes are expected.

Access to the Smith River at Ruby Van Deventer County Park would be maintained at all times (refer to the “Ruby Van Deventer County Park” section for additional details). Anticipated traffic delays at each site are estimated to be a maximum of 15 minutes. In addition, construction at the Ruby 1 and 2 sites may occur during different construction seasons.

Coordination with the National Park Service, required by the Wild and Scenic Rivers Act, has been initiated for the main stem of the Smith River and completed with regard to the proposed improvements at the two project locations along SR 197. A letter was received from the National Park Service in February 2010 stating that construction of the proposed project at the Ruby 1 and Ruby 2 sites would not have a direct and adverse effect on the values for which the Smith River was designated. A copy of this letter was included in Chapter 4 of the DEIR/EA.

### **Middle Fork Smith River**

US 199 winds through the canyon of the Middle Fork Smith River in a southwest-northeast direction, providing access for recreational opportunities along the river. Tributaries to the river (Monkey Creek, Patrick Creek, and Kelly Creek) are located along the US 199 corridor; however, the project locations are not located at the confluence of these tributaries with the Middle Fork Smith River. This is also the case for the Siskiyou Fork Smith River. No direct or adverse effects on the values for which these tributaries are designated as Wild and Scenic Rivers are expected to occur.

Proposed improvements at the project locations are located adjacent to the Middle Fork Smith River. The approximate distances from the wetted channel of the summer flow level of the river and SR 199 at each location are listed below:

- **Patrick Creek Narrows Location 1:** within approximately 50 to 100 feet
- **Patrick Creek Narrows Location 2:** US 199 spans the river
- **Patrick Creek Narrows Location 3:** more than 100 feet
- **The Narrows:** within approximately 50 to 100 feet
- **Washington Curve:** more than 100 feet

As stated previously, at four of the five project locations on US 199, the proposed project does not involve construction in the bed or on the banks of the river (below the OHWM), and it is not considered to be a water resources project subject to review under Section 7 of the Wild and Scenic Rivers Act (16 USC 1271–1287). In August 2005, the Department received correspondence from the Forest Service regarding proposed improvements at the Narrows site that concluded that the proposed project at this location would not have a direct or adverse effect on the values for which the river was designated (USDA Forest Service 2005). In addition, the letter stated that any change in scope of the project would require notifying the Forest Service (2005). This letter is included in Chapter 4 of the EIR/EA. A letter was sent on March 26, 2012 requesting concurrence with the potential effects on the Middle Fork Smith River as required by the Wild and Scenic Rivers Act, in addition to concurrence with the *de minimis* impact finding on the Smith River NRA and the temporary occupancy of the Middle Fork Smith River through Section 4(f) coordination. Written concurrence was obtained from the Forest Service after the public was afforded an opportunity to review and comment on the effects of the proposed project during circulation of the DEIR/EA. The concurrence letter was signed on April 5, 2012. A copy of this signed letter is included in Chapter 4 of the EIR/EA.

### **Proposed Bridge Replacement at Patrick Creek Narrows Location 2**

Three alternatives for improvements were considered at this location where US 199 spans the Middle Fork Smith River: the Upstream Bridge Replacement, Downstream Bridge Replacement, and Bridge Preservation with Upslope Retaining Wall Alternatives. Refer to the project description above and in Chapter 1 of the DEIR/EA and FEIR/EA for complete descriptions of the build alternatives at this location. The Department selected the Downstream Bridge Replacement Alternative as the selected preferred alternative after reviewing public comments and coordinating with resource agencies. This alternative is anticipated to require controlled blasting (ICF International 2010b).

A retaining wall would be constructed downstream from and southeast of the new bridge. The retaining wall would extend for approximately 150 feet and transition into the viaduct portion of the proposed new bridge. The retaining wall would be constructed down-slope from the highway level and would be supported by drilled piles within the riparian zone, approximately 15-40 feet from the ordinary high water level of the Middle Fork Smith River. The viaduct portion of the proposed bridge would cantilever the northbound traffic lane over the bank of the Middle Fork Smith River and would be a continuous structure with the arch portion of the bridge. The total length of the viaduct and arch portions of the bridge would be approximately 345 feet. This alternative would also require a retaining wall on the northern side of the bridge that would be approximately 10 feet high and 100 feet long (Figure 3). The new bridge design would be a concrete arch bridge with aesthetic treatment. The other structures would receive aesthetic treatment as well. The existing bridge would be removed once the new bridge was in place. Construction of this alternative was formerly thought to need in-river work requiring diversion of the Middle Fork Smith River, a trestle, falsework, and a debris containment system. After circulation of the draft EIR/EA, the Department conducted more studies and concluded that bridge replacement could and would be constructed so that no heavy equipment and only minimal temporary foot traffic would occur within the wetted channel, and there would be no water diversion for bridge construction and no trestle, falsework, or debris containment system with structures in the wetted channel. Falsework/demolition platforms will be placed within 5-10 feet of the active low summer flow level (just above of the wetted channel) and would be removed prior to the rainy season (October 15- June 15). Construction at this location is anticipated to take approximately 300 days over three seasons, anticipated to begin in late summer/fall 2013 and ending in late fall/winter 2015. The slope south of the bridge would be cut during the first season, and one or both retaining walls would be constructed. In the second season, the bridge (and possibly the remaining retaining wall, if not built in the first season) would be built. In the third season, the old bridge would be demolished. Most work would be conducted above ordinary high water.

Table B-4 provides the preliminary construction schedule for Patrick Creek Narrows Location 2 for the selected preferred alternative.

**Table B-4. Preliminary Construction Schedule at Patrick Creek Narrows Location 2**

Location 2 Selected Preferred Alternative	Construction Season <sup>a</sup> /Year Target	Approximate Construction Duration (Working Days) <sup>b</sup>
Downstream Bridge Replacement	Three seasons starting in late summer/fall 2013 and ending in late fall/winter 2015	300

<sup>a</sup> A construction season typically extends from summer through fall. At this location, the season may extend into winter in 2015.

<sup>b</sup> Number of working days is approximate.

As shown in Table B-4, construction at this location would occur year-round, yet primarily during summer and fall, with the exception of the third construction season, which may extend into winter 2015. There will be work below the OHWM during the dry season, when river flow conditions are low. There will be no work in the wetted channel, i.e., there will be no in-water construction work.

The closest access to the river in the vicinity of Patrick Creek Narrows Location 2 is from the Cedar Rustic Trail, an informal river access trail at PM 23.5 used for seasonal fishing. There are no other designated river access trails in this area, and there are no designated beaches along this segment of the river. Recreational activities in this area are most likely seasonal fishing, kayaking, and rafting. The fishing season extends all year, although chinook salmon and steelhead fishing typically occurs during winter and fall. The kayaking and rafting season on the Middle Fork Smith River is typically during winter, spring, and fall, when the river is navigable (USDA Forest Service 2009c). Although construction is expected to occur mainly during the off-season for the primary recreation activities, recreationists would be subject to periodic exclusion from the construction zone within the project limits for safety reasons during periods when dangerous bridge replacement, demolition work, and removal of the cut slope are occurring. The free-flowing condition of the river would not be affected upstream or downstream of the construction limits necessary for bridge replacement and demolition. No temporary water diversion techniques will be used to support the falsework and debris containment system; these structures will span the wetted channel during the dry season. The falsework would be removed prior to the start of the rainy season (typically October 15-June 15). Recreation activities on the river would continue upstream and downstream of the construction limits because the river would not be diverted, allowing water to flow under and downstream of the bridge. Recreation use of the river would not be interrupted upstream or downstream of the limited construction zone. The construction season could coincide with part of the fishing, kayaking, and rafting season during fall 2013, 2014, and 2015, and winter 2015. If boaters are present at the same time that bridge construction/demolition/cut slope removal are in place, boaters would need to portage around the construction area for safety reasons since the platform spanning the bridge may only be several feet above the wetted channel. The Department will conduct ample media alerts and install signage upstream and downstream of the construction area, along the river, to notify potential boaters of the need to portage around the construction area. The temporary interruption of recreation activities during a portion of construction is considered a temporary occupancy of the river at this location. All construction debris would be removed, and disturbed areas would be restored to a natural setting with re-grading, erosion control, and revegetation of disturbed areas. All materials used for temporary construction, including potential concrete pads used to support temporary falsework, will be removed after construction is complete. Removal may include chipping and/or jack-hammering concrete pads out as much as is feasible, with the debris from this work being contained with tarps or by other means. These measures would help ensure that the proposed work would be minor, there would be no permanent adverse physical impacts, and the land being used would be fully restored (i.e., the property would be returned to a condition which is at least as good as that which existed prior to the project), all of which are criteria for meeting the finding of temporary occupancy under Section 4(f). Replacement of the existing bridge with a new bridge in close proximity to the existing alignment, plus removal of the existing bridge so that there is only one bridge in the channel, is considered returning the property to a condition that is at least as good as that which existed prior to the project. Temporary and permanent best management practices would be implemented in addition to specific measures to minimize or mitigate potential adverse impacts on the river as included in the DEIR/EA and FEIR/EA.

### **Temporary Occupancy during Construction for the Smith River Wild and Scenic River System**

Under FHWA regulations (23 CFR 774.13[d]), temporary occupancy of a property does not constitute use of a Section 4(f) resource when the following conditions are satisfied:

- **The duration of the occupancy must be temporary (i.e., less than the time needed for construction of the project), and there should be no change in ownership of the land.** Construction at this location is anticipated to take approximately 250 to 400 working days over a period of three seasons, from summer/fall 2013 through late fall/winter 2015. Once bridge construction work is completed each season at this location, full use of the river for recreation activities (fishing, kayaking, and rafting) within the project construction limits would resume. During construction, recreation use of the river would not be interrupted upstream or downstream of the limited construction zone, since there would be no temporary water diversion techniques used. The construction season could coincide with part of the fishing, kayaking, and rafting season during the fall and winter seasons. If boaters are present at the same time that bridge construction/demolition/cut-slope removal is in place, boaters would need to portage around the construction area on a temporary basis for safety reasons. They would be notified by ample media alerts and signage installed upstream and downstream of the construction area, along the river. The falsework would be removed prior to the start of the rainy season (typically October 15-June 15). Construction activities would not require a change in ownership of the lands adjacent to the river. The project meets this temporary occupancy criterion.
- **The scope of work must be minor (i.e., both the nature and magnitude of the changes to the Section 4(f) property are minimal).** No diversion techniques will be used in the river channel; bridge construction work would span the wetted channel. Replacement of the existing bridge with a new bridge in close proximity to the existing alignment, plus removal of the existing bridge so that there is only one bridge in the channel, is considered returning the property to a condition that is at least as good as that which existed prior to the project. All construction debris would be removed and disturbed areas would be restored to a natural setting with re-grading, erosion control, and revegetation of disturbed areas. All materials used for temporary construction, including potential concrete pads used to support temporary falsework, will be removed after construction is complete. The project meets this temporary occupancy criterion.
- **There are no anticipated permanent adverse physical impacts, nor will there be interference with the protected activities, features, or attributes of the property, on either a temporary or permanent basis.** No permanent adverse physical impacts on the river are anticipated as a result of the construction activities at this location. All materials used for temporary construction, including potential concrete pads used to support temporary falsework, will be removed after construction is complete. Temporary and permanent best management practices would be implemented in addition to specific measures to minimize or mitigate potential adverse impacts on the river, as described in the resource-specific sections in Chapter 2 of the DEIR/EA and FEIR/EA. Recreation activities on the river would continue upstream and downstream of the construction limits, and would not be interrupted, because the river would be allowed to flow under the bridge unimpeded. If boaters are present at the same time that bridge construction/demolition/cut-slope removal is in place, boaters would need to portage around the construction area for safety reasons. They would be notified by

ample media alerts and signage installed upstream and downstream of the construction area, along the river. The project meets this temporary occupancy criterion.

- **The land being used must be fully restored (i.e., the property must be returned to a condition which is at least as good as that which existed prior to the project).** The falsework and debris containment system above the river channel would be removed before the rainy season (typically October 15-June 15). The proposed work would be conducted in already disturbed areas within the channel and banks, since there is a gabion wall, existing spread footing foundations, and grouted rock slope protection where the southern retaining wall, viaduct portion of the bridge, and bridge would be constructed. All construction debris would be removed, and disturbed areas would be restored to a natural setting with re-grading, erosion control, and revegetation of disturbed areas. All materials used for temporary construction, including potential concrete pads used to support temporary falsework, will be removed after construction is complete. The project meets this temporary occupancy criterion.
- **There must be documented agreement of the official(s) with jurisdiction over the Section 4(f) resource regarding the above conditions.** A letter was sent on March 26, 2012 requesting concurrence with the potential effects on the Middle Fork Smith River as required by the Wild and Scenic Rivers Act, in addition to concurrence with the *de minimis* impact finding on the Smith River NRA and the temporary occupancy of the Middle Fork Smith River through Section 4(f) coordination. Written concurrence was obtained from the Forest Service after the public was afforded an opportunity to review and comment on the effects of the proposed project during circulation of the DEIR/EA. The concurrence letter was signed on April 5, 2012 (see Chapter 4 of the FEIR/EA).

As described above, the temporary occupancy of the Middle Fork Smith River would meet all the criteria outlined in 23 CFR 774.13(d) for temporary occupancy.

### **Potential Proximity Impacts during Construction for the Smith River Wild and Scenic River System**

Similar to the discussion for the Smith River along SR 197, the primary source of noise on the banks of the Middle Fork Smith River or on the river itself would be from water flowing. Noise from traffic on US 199 is part of the existing experience along the river for recreationists. However, the potential for additional noise would be greatest at Patrick Creek Narrows Location 2 and the Narrows site because of the need for blasting on slopes above the roadway. Blasting may be required at Patrick Creek Narrows Location 2, and blasting would be required at the Narrows site. Blasting activities would occur intermittently during daylight hours at a distance of more than 50 to 100 feet from the river at both the Narrows site and at Patrick Creek Narrows Location 2. The peak noise level from blasting at a distance of 100 feet was estimated at 143 dBA. The results in the noise study report indicate that sound from blasting could range from “distinctly unpleasant to intolerable” (120–140 dBA) at these locations (ICF International 2010b). However, during blasting activities, a safety zone would be established at a distance from the blast site on either side of the bridge, including along the roadway and the river. The safety zone would be established prior to blasting and incorporate a buffer area large enough to avoid safety concerns from the blast concussion and falling debris. Recreationists would not be exposed to the peak noise level but would experience increased noise during intermittent and short periods while blasting activities are occurring. Noise and ground vibration control

measures would be implemented to reduce the potential noise impacts (ICF International 2010b). These measures are summarized in above in Section B.5. Given the proximity of the river to the nearby highway, existing sound from occasional truck traffic, noise from water flow, and the fact that blasting would likely be limited to two or three isolated blasts per day, noise from blasting activities is not expected to impair the use or enjoyment of the river for recreational purposes.

Blasting would not be required at Patrick Creek Narrows Location 1 or 3. The noise study report indicates that at Patrick Creek Narrows Location 1, the maximum noise levels during construction periods could range from 88 to 92 dBA at a distance of 50 feet from the construction equipment and 80 to 86 dBA at 100 feet (ICF International 2010b). During construction at Patrick Creek Narrows Location 3, the maximum noise levels during construction periods could range from 88 to 92 dBA at a distance of 50 feet from the construction equipment and 80 to 84 dBA at 100 feet. There are no designated river access points at either location, with the exception of Sandy Beach, which is located near the terminus of Patrick Creek Narrows Location 1. Potential noise levels at Sandy Beach are discussed in Section B.4. Noise from construction activities is not expected to impair the use or enjoyment of the river for recreational purposes at these locations.

Implementation of measures included in the visual impact assessment would reduce and minimize potential impacts attributable to visual impacts for recreationists on or near the river (ICF International 2010d). The views from the river toward US 199 are typically from below the level of the roadway (Patrick Creek Narrows Locations 1 and 2 and the Narrows site), and in some locations, such as at Patrick Creek Narrows Location 3 and the Washington Curve site, views are shielded by vegetation and Douglas-fir forest. However, direct views of the roadway from the river exist at the other locations, and temporary views of construction activities can be expected. These temporary views are not expected to impair the use or enjoyment of the river for recreational purposes.

Access to the river for recreational activities would be maintained at all times throughout the construction period of the proposed project. Construction at the project locations on US 199 would not occur on weekends (beginning after 3 p.m. on Fridays), designated legal holidays, and the day preceding designated legal holidays. Traffic delays are expected on US 199 (see the discussion provided for the Smith River NRA).

### **B.8.3.3 Findings for the Smith River Wild and Scenic River System**

#### ***Smith River (Main Stem)***

The proposed project at the Ruby 1 and 2 sites on SR 197 would not have a direct or adverse effect on the recreational value for which the Smith River is designated. In addition, the proposed project at the Ruby 1 and 2 sites would not cause a constructive use of the Smith River Wild and Scenic River system because the proximity impacts would be temporary and would not substantially impair the protected activities, features, or attributes of the Smith River Wild and Scenic River system for recreation. Therefore, the provisions of Section 4(f) would not be triggered.

### **Middle Fork Smith River**

The proposed project, at the project locations along US 199, would not require permanent use of the Middle Fork Smith River, a component of the Smith River Wild and Scenic River system. The proposed project would not have a direct or adverse effect on the values for which the Middle Fork Smith River was designated a Wild and Scenic River. In addition, potential proximity impacts would not constitute a constructive use because they would not hinder the preservation or recreation use of the Middle Fork Smith River. Further, the temporary occupancy of the Middle Fork Smith River for construction at Patrick Creek Narrows Location 2 would meet all of the temporary occupancy criteria outlined in 23 CFR 774.13(d). The temporary occupancy would not have a direct or adverse effect on the values for which the Middle Fork Smith River was designated a Wild and Scenic River. Therefore, the provisions of Section 4(f) would not be triggered.

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## **B.9.2 Personal Communications**

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## Appendix C Title VI Policy Statement

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# Appendix C Title VI Policy Statement

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March 16, 2012

## **NON-DISCRIMINATION POLICY STATEMENT**

The California Department of Transportation, under Title VI of the Civil Rights Act of 1964 and related statutes, ensures that no person in the State of California shall, on the grounds of race, color, national origin, sex, disability, religion, sexual orientation, or age, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity it administers.

For information or guidance on how to file a complaint based on the grounds of race, color, national origin, sex, disability, religion, sexual orientation, or age, please visit the following web page: [http://www.dot.ca.gov/hq/bep/title\\_vi/t6\\_violated.htm](http://www.dot.ca.gov/hq/bep/title_vi/t6_violated.htm).

Additionally, if you need this information in an alternate format, such as in Braille or in a language other than English, please contact Mario Solis, Manager, Title VI and Americans with Disabilities Act Program, California Department of Transportation, 1823 14<sup>th</sup> Street, MS-79, Sacramento, CA 95811. Phone: (916) 324-1353, TTY 711, fax (916) 324-1869, or via email: [mario\\_solis@dot.ca.gov](mailto:mario_solis@dot.ca.gov).

A handwritten signature in blue ink that reads "Malcolm Dougherty".

MALCOLM DOUGHERTY  
Acting Director

*"Caltrans improves mobility across California"*



# Appendix D Relocation Plans

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# Appendix D Relocation Plans

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## **Relocation Assistance Advisory Services**

In accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, the Department will provide relocation advisory assistance to any person, business, farm, or nonprofit organization displaced because of the acquisition of real property for public use. The Department will assist residential displacees in obtaining comparable replacement housing by providing current and continuing information on the availability and prices of both houses for sale and rental units that are “decent, safe and sanitary.” Nonresidential displacees will receive information on comparable properties for lease or purchase. Residential housing will be located in equal or better neighborhoods at rents or prices within the financial ability of the displacees, and will be reasonably accessible to the displacees’ places of employment. Replacement dwellings that are open to all persons regardless of race, color, religion, sex, and national origin and that are consistent with the requirements of Civil Rights Act Title VIII will be offered to displacees before any displacement occurs. Displacees will also receive information concerning federal and state assisted-housing programs and any other services known to be offered by public and private agencies in the area. Before they are asked to move, persons who are eligible for relocation payment(s) and are legally occupying a property required for the proposed project will be given at least 90 days written notice and offered at least one decent, safe, and sanitary residence, available on the market, by the Department.

## **Residential Relocation Payments Program**

The Relocation Payment Program will help eligible residential occupants by paying certain costs and expenses. These costs are limited to those necessary for or incidental to the purchase or rental of the replacement dwelling and actual reasonable moving expenses to a new location within 50 miles of the displacement property. Any actual moving costs in excess of the 50 miles are the responsibility of the displacee. The Residential Relocation Program is summarized below.

### **Moving Costs**

Any displaced person who lawfully occupied the acquired property, regardless of the length of occupancy in the property acquired, will be eligible for reimbursement of moving costs. Displacees will receive either the actual reasonable cost involved in moving themselves and personal property up to 50 miles or a fixed payment based on a fixed moving cost schedule.

## **Purchase Supplement**

In addition to moving and related expense payments, fully eligible homeowners may be entitled to payments for increased costs of replacement housing. Homeowners who have owned and occupied their property for 180 days or more prior to the date of the first written offer to purchase the property may qualify to receive a price differential payment and may qualify to receive reimbursement for certain nonrecurring costs incidental to the purchase of the replacement property. An interest differential payment is also available if the interest rate for the loan on the replacement dwelling is higher than the loan rate on the displacement dwelling, subject to certain limitations on reimbursement based upon the replacement property interest rate. The maximum combination of these three supplemental payments that the owner-occupant can receive is \$22,500. If the total entitlement (without the moving payments) is in excess of \$22,500, the Last Resort Housing Program will be used.

## **Rental Supplement**

Tenants who have occupied the property to be acquired for 90 days or more and owner-occupants of 90 to 179 days prior to the date of the first written offer to purchase may qualify to receive a rental differential payment. This payment is made when the Department determine that the cost to rent a comparable “decent, safe, and sanitary” replacement dwelling will be more than the present rent of the displacement dwelling. As an alternative, the tenant may qualify for a down payment benefit designed to assist in the purchase, subject to certain limitations noted below under “Down Payment.” In addition to moving expenses, the maximum amount payable to any tenant of 90 days or more and any owner-occupant of 90 to 179 days is \$5,250. If the total entitlement for rental supplement exceeds \$5,250, the Last Resort Housing Program will be used.

In addition to the occupancy requirements, to receive any relocation benefits, the displaced person must buy or rent and occupy a “decent, safe, and sanitary” replacement dwelling within 1 year from the date the department takes legal possession of the property or from the date the displacee vacates the displacement property, whichever is later.

## **Down Payment**

The down payment option has been designed to aid owner-occupants of 90 to 179 days and tenants with no less than 90 days of continuous occupancy prior to the project proponent’s first written offer. The down payment and incidental expenses cannot exceed \$5,250. The 1-year eligibility period in which to purchase and occupy a “decent, safe, and sanitary” replacement dwelling will apply.

## **Last Resort Housing**

Federal regulations (49 Code of Federal Regulations 24) contain the policy and procedure for implementing the Last Resort Housing Program on federal aid projects. Last Resort Housing benefits are, except for the amounts of payments and the methods in making them, the same as

those benefits for standard residential relocations as explained above. Last Resort Housing has been designed primarily to cover situations in which a displacee cannot be relocated because of a lack of available comparable replacement housing or when the anticipated replacement housing payment exceeds the \$5,250 and \$22,500 limits of the standard relocation procedure because either the displacee lacks the financial ability or other valid circumstances. In certain exceptional situations, Last Resort Housing may also be used for tenants of less than 90 days.

After the first written offer to acquire the property has been made, the Department will, within a reasonable length of time, contact the displacees to gather important information, including the following:

- Preferences in areas of relocation;
- Numbers of people to be displaced and the distribution of adults and children according to age and sex;
- Locations of school and employment;
- Specific arrangements needed to accommodate any family member's special needs; and
- Financial abilities to relocate into comparable replacement dwelling that will adequately house all members of the family

## **Nonresidential Relocation Assistance Program**

The Nonresidential Relocation Assistance Program provides assistance to businesses, farms, and nonprofit organizations in locating suitable replacement property and reimbursement for certain costs involved in relocation. The Relocation Advisory Assistance Program will provide current lists of properties offered for sale or rent suitable for a particular business's specific relocation needs. The types of payments available to eligible businesses, farms, and nonprofit organizations are: moving and searching expenses, and possibly re-establishment expenses, or a fixed in lieu payment instead of any moving, searching, and re-establishment expenses. The payment types are summarized below.

### **Moving Expenses**

Moving expenses may include the following actual, reasonable costs:

- Moving of inventory, machinery, equipment and similar business-related property dismantling, disconnecting, crating, packing, loading, insuring, transporting, unloading, unpacking, and reconnecting of personal property;
- Loss of tangible personal property provides payment for actual, direct loss of personal property that the owner is permitted not to move; and
- Expenses related to searching for a new business site (up to \$1,000 for reasonable expenses actually incurred)

## **Reestablishment Expenses**

Eligible businesses, farms, and nonprofit organizations may receive reestablishment expenses related to the operation of the business at the new location (up to \$10,000 for reasonable expenses actually incurred).

## **Fixed In Lieu Payment**

A fixed payment in lieu of moving and searching payments and reestablishment payments may be available to businesses that meet certain eligibility requirements. This payment is an amount equal to the average annual net earnings for the last two taxable years prior to the relocation and may not be less than \$1,000 or more than \$20,000.

## **Additional Information**

### **Relocation Payments Not Income**

Reimbursement for moving costs and replacement housing payments are not considered income for the purpose of the Internal Revenue Code of 1954 or resources for the purpose of determining the extent of eligibility of a displacee for assistance under the Social Security Act, local Section 8 housing programs, or other federal assistance programs.

### **Right to Appeal**

Any person, business, farm, or nonprofit organization that has been refused a relocation payment by the project proponent's relocation advisor or believes that the payment(s) offered by the agency are inadequate, may appeal for a special hearing of their complaint. No legal assistance is required. Information about the appeal procedure is available from the relocation advisor.

# Appendix E Minimization and/or Mitigation Summary

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# Appendix E Minimization and/or Mitigation Summary

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## **Widen and Upgrade Private Road Approaches at Ruby 2 Site**

The private road approaches to residential properties affected by improvements at the Ruby 2 site would be widened and upgraded to current standards as part of the proposed project. As part of the widening of SR 197 and reconstruction of private road approaches, any mailboxes, fencing, signage, or landscaping (including ornamental trees) displaced by the proposed project on affected residential properties would be replaced in coordination with property owners.

## **Follow Best Management Practices to Implement Permanent Enhanced Erosion Control Seeding and Revegetation for the Proposed Project**

The Department, or its contractor, would follow the measures for permanent enhanced erosion control seeding and revegetation, as listed in Section 2.3.1.3, “Avoidance, Minimization, and/or Mitigation Measures for Natural Communities in the Biological Environment,” and also listed in Appendix R, Enhanced Erosion Control Seeding and Revegetation Plan. Following those proposed measures would ensure seeding and revegetation that reflect natural existing vegetation patterns and provide multiple canopy layers, seasonality, diverse habitat, and reduced susceptibility to disease.

## **Implement Best Management Practices for Project Design and Construction**

The following design practices will be utilized to maximize project aesthetics and minimize visual impacts:

- The Department will coordinate with the Forest Service and the public to select locally appropriate aesthetic treatments for the final design of retaining walls, bridges, barriers, and other construction elements. Aesthetic treatments will address materials, patterns, texture, and color.
- Refer to local reference sites that are within 30 miles of the project area, such as Idlewild Curves, Hardscrabble Creek Bridge and Hiouchi/Myrtle Creek Viaduct sites on US 199, for design and construction treatments that will reduce visual impact and retaining wall and bridge aesthetics. This may include the use of slope rounding, steeper cut slopes to reduce wall area and/or cut surface areas, use of flatter toes at cut slopes to provide area for rock fall instead of using a retaining structure, using redwood soldier pile retaining walls, and mimicking aesthetics from local historical bridges within the new bridge design to lessen impacts on visual resources.

## **Construct Walls with Low-Sheen and Non-Reflective Surface Materials**

To reduce the potential for glare, retaining walls will be constructed with construction materials with pattern, texture and color similar to that which exists in the area and using low-sheen and

non-reflective surface materials. The finish would be matte and roughened. The use of smooth, trowelled surfaces and glossy paint would be avoided.

### **Implement Avoidance and Notification Procedures for Cultural Resources**

It is the Department's policy to avoid cultural resources whenever possible. If cultural materials are discovered during construction, all earthmoving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find. The Department will implement all reasonable measures needed to avoid, minimize, or mitigate further harm to the resource. If appropriate, the Department will notify Indian tribes or Native American groups that may attach religious or cultural significance to the affected property.

If human remains are discovered, State Health and Safety Code Section 7050.5 states that further disturbances and activities shall cease in any area or nearby area suspected to overlie remains, and the county coroner shall be contacted. Pursuant to PRC Section 5097.98, if the remains are thought to be Native American, the coroner will notify the NAHC, which will then notify the Most Likely Descendent (MLD). The Department will work with the MLD to avoid the remains, and if avoidance is not feasible, to determine the respectful treatment of the remains. Further provisions of PRC Section 5097.98 are to be followed as applicable.

### **Implement Standard Specifications, Special Provisions, and Permit Requirements**

Contract standard specifications, special provisions, and permit requirements reduce potential short-term impacts. Construction-related impacts are managed by 2006 Standard Specifications Section 7-1.01G, 01-20-12 Amendments to 2006 Standard Specifications Section 7-1.50B FHWA-1273, 2010 Standard Specifications Section 13, 2010, 2010 Revised Standard Specifications Section 13-1.01 (01-20-12), Standard Special Provisions (SSP) 07-345 (2006), various 2010 SSPs as appropriate, Construction General Permit Order No. 2009-0009-DWQ, NPDES General Permit No. CAS000002, Caltrans Storm Water permit, Order 99-06-DWQ, and NPDES Permit No. CAS000003. Short-term protections are contained in the Department's Construction Site BMP manual.<sup>1</sup> These are minimum requirements that must be met by all Contractors working on Department projects. The Department has a program to research and test the effectiveness of new BMPs for construction sites (CTSW-RT-03-049), which allows for continued improvement of BMPs for construction sites. An active SWPPP program also provides BMP inspection and sampling to ensure their maintenance until the project is complete and the site stabilized.

### **Minimize Sediments, Turbidity, and Floating Material**

Suspended material is the most likely pollutant resulting from Department construction projects. Erosion of sediments is the main source of suspended material. Turbidity and floating material are reduced through the use of BMPs. Implementing standard Department practices and procedures will reduce potential impacts.

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<sup>1</sup> <http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm>

During the construction activities, the standard BMPs listed below would be utilized to reduce or eliminate sediment, turbidity, and floating materials to receiving waters:

- SS-1 Scheduling
- SS-2 Preservation of Existing Vegetation
- SS-3 Hydraulic Mulch
- SS-4 Hydroseeding
- SS-5 Soil Binders
- SS-6 Straw Mulch
- SS-7 Geotextiles, Plastic Covers, Erosion Control Blankets: Cover Soil/Stockpiles
- SC-1 Silt Fence
- SC-5 Fiber Rolls
- SC-7 Street Sweeping and Vacuuming
- SC-10 Storm Drain Inlet Protection
- WE-1 Wind Erosion Control
- TC-1 Stabilized Construction Entrance/Exit
- NS-1 Water Conservation Practices

Additional BMPs that may be used on this project for sediment control are as follows:

- SS-12 Streambank Stabilization
- SC-3 Sediment Trap
- SC-4 Check Dams
- SC-6 Gravel Bag Berms
- SC-9 Straw Bale Barrier
- TC-3 Entrance/Outlet Tire Wash
- NS-2 Dewatering Operations
- NS-4 Temporary Stream Crossing
- NS-5 Clear Water Diversion

In addition to BMPs required as part of the project-specific Stormwater Pollution Prevention Plan (SWPPP), Design Pollution Prevention BMPs reduce the amount of erosion during construction using slope designs that reduce erosion potential via techniques such as slope rounding, benching, track walking, reducing slope length, and providing top of slope drains. Hydraulic design techniques also reduce erosion through the use of Pollution Prevention BMPs such as flared-ends sections, rock slope protection, paved water conveyances, and energy-

dissipater pads. These BMPs have been demonstrated to be effective for reducing erosion and sedimentation to non-significant levels.

### **Minimize Oil, Grease, and Chemical Contamination**

Contract specifications and permit conditions prohibit the Contractor from discharging oils, greases, or chemicals into receiving waters. Construction operations are required to follow BMPs that provide potentially harmful chemical containment and spill protection. Construction site accidents may introduce pollutants to the environment. The Department addresses these problems with detection and reporting procedures to ensure prompt cleanup. By implementing Construction Site BMPs and SSPs, any build alternatives selected would reduce potential impacts from construction-related oils, greases, and chemicals. The following BMPs may be deployed to prevent and reduce releases of these pollutants during the active construction period:

- NS-3 Paving and Grinding Operations
- NS-6 Illicit Connection/Illegal Discharge Detection and Reporting
- NS-8 Vehicle and Equipment Cleaning
- NS-9 Vehicle and Equipment Fueling
- NS-10 Vehicle and Equipment Maintenance
- NS-12 Concrete Curing
- NS-13 Material and Equipment Use Over Water
- NS-14 Concrete Finishing
- NS-15 Structure Demolition/Removal Over or Adjacent to Water
- WM-1 Material Delivery and Storage
- WM-2 Material Usage
- WM-3 Stockpile Management
- WM-4 Spill Prevention and Control
- WM-8 Concrete Waste Management

Additional BMPs that may be used prevent and reduce the release of these pollutants include:

- WM-5 Solid Waste Management
- WM-6 Hazardous Waste Management
- WM-7 Contaminated Soil Management
- WM-9 Sanitary/Septic Waste management
- WM-10 Liquid Waste Management

## **Stabilize Proposed Cut and Fill Areas**

### Ruby 2

The potential for increased erosion associated with the proposed cuts would be reduced by slope rounding and revegetation (i.e., erosion control seeding and/or installation of containerized plants).

### Patrick Creek Narrows Location 2

The risk of landslides and rockfall associated with the different alternatives would be reduced by the following or similar measures: implementation of appropriate cut-slope ratios, slope rounding, controlled blasting, catchment areas, rock bolts,<sup>2</sup> anchored wire mesh, and retaining walls.

### The Narrows

The potential for rockfall and landslides would be reduced by controlled blasting, rock bolts, anchored wire mesh, and cable drapes.

### Washington Curve

The Retaining Wall Alternative would have a lower potential for erosion than the Cut Slope Alternative. The potential of landslides and rockfall associated with the Cut Slope Alternative would be reduced by an appropriate cut-slope ratio, slope rounding, and catchment area for rocks at the bottom of the slope. After construction is completed, a chain link fence would be constructed along the top of the proposed wall if needed to prevent rocks from entering the roadway from the slope above.

## **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

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<sup>2</sup> The purpose of rock bolts as part of a retaining wall is to pin two planes of rock, by bolting the slipping plane to a solid rock plane. Rock bolting is a construction technique used when constructing a retaining wall in rocky material. A crane with a drill rig on a platform is raised to the desired location. Loose rock is removed, a hole is drilled, and compressed air flushes the bored hole clean and the drill hole is further widened. Finally, a bar is bolted and secured with epoxy in place, then grouted and tensioned along its length. Each grouted and secured bar is finally locked with a faceplate. Rock bolted tension bars are constructed along the face of the retaining wall to secure the new slope in place.

(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 cover<sup>3</sup> 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

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<sup>3</sup> “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](http://www.cnps.org/cnps/vegetation/pdf/1_CNPS_TableMtn_Final_Report.pdf) on 8/4/12.)

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.

### **Delineate Environmentally Sensitive Areas with Exclusionary Fencing**

The Department will restrict access to areas on project plans, in order 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.

### **Protect Roots of Large Trees**

There are many large old redwood trees (greater than 36 inch dbh) and large Douglas-fir trees (greater than 24 inch dbh) within the project areas. 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 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 and arborist.
- 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 without approval of the on-site arborist.
- 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 1<sup>st</sup> and September 30<sup>th</sup>.
- 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).Limit Construction in Waters of the State/United States to the Dry Season

### **Limit Construction in Waters of the State/United States to the Dry Season**

To minimize and avoid impacts on waters of the United States, work in watercourses will be scheduled to take place during periods of low flow or when the watercourse is dry, which can be as early as May 2 and as late as October 15. When watercourses are dry, no stream diversion is required; sediment discharge is avoided. Many frog and salamander species move to other areas when seasonal streams dry-up. Therefore, impacts to these species would be avoided by working when the watercourse is dry. Specific work windows and limitations on construction will be determined as a result of Endangered Species Act Section 7 consultations and permits from federal and state regulatory agencies.

## Implement Erosion and Pollution Control Measures

To maintain water quality and minimize the movement of soils and sediment into and within the project watercourses, effective erosion and pollution control measures will be developed and implemented. These measures will be implemented for all ground disturbing activities during and after construction as is practicable. It is expected that minor amounts of sediment discharge due to this project are unavoidable. However, the Department will ensure that applicable BMPs are used to stabilize all disturbed soil areas to minimize adverse effects on water quality, aquatic habitat, and listed fish species. The following measures and BMPs are applicable to the proposed project.

- Temporary construction BMPs will include the following measures and features:
  - **Soil stabilization and wind erosion control:** scheduling, preservation of existing vegetation, hydraulic mulch, erosion control blankets, and stream bank stabilization
  - **Sediment control:** silt fences, check dams, fiber rolls, gravel bag berms, street sweeping, and storm drain inlet protection
  - **Tracking control:** stabilized construction entrances/exits; non-stormwater management measures to address paving and grading operations; temporary dewatering and clear water diversions, and structure demolition/removal over or adjacent to water
  - **Waste management and material pollution control:** material handling and storage, concrete waste management, and sanitary waste management
- Site-specific temporary construction BMPs will be identified in a Water Pollution Control Program or Storm Water Pollution Prevention Plan developed by the Contractor and authorized by the Resident Engineer.
- Water Pollution Control BMP measures considered will include flow conveyance systems such as dikes, overside drain outlet protection and velocity dissipation devices; slope and surface protection systems such as vegetated surfaces and hard surfaces.
- To reduce long-term erosion and sediment discharge into receiving waters, RSP will be placed at culvert outlets. Typically, 6-foot-wide by 14-foot-long area of RSP is placed in the drainage channel. The RSP consists of 1/4-ton crushed rock (approximately 1.8 feet in diameter).
- On-site duff, composed of leaf litter and small branches, will be collected prior to construction whenever feasible, stockpiled, then reapplied. All trees removed, that are not used for other purposes for the project, will be processed through a chipper and the chips applied to the areas of exposed soil within the project area as a soil-stabilizing mulch.
- Disturbed soils will be seeded with an enhanced erosion control seed mix appropriate to the habitat(s) at each project location, using regionally appropriate, native species (also see Section 2.3.1.4).
- Excess material excavated from the work site will be disposed of off site at an appropriately permitted state owned or private, disposal site, or placed in typical limits of work as shown on the project layouts, in accordance with the Department's specifications.

### **Evaluate and Implement Permanent Storm Water Treatment Options**

Approximately 1–2 acres of additional impervious surface will be added to the highway facility as a result of the proposed project. Storm water treatment BMPs will be incorporated to address pollutant removal from stormwater runoff. Treatment BMPs evaluated will include Low-Impact Development–type BMPs such as biofiltration strips and swales. Because traction sand is applied occasionally, traction sand traps will be evaluated and constructed where feasible. Treatment BMPs will be designed to meet approved guidelines.

### **Compensate for Temporary and Permanent Impacts on Wetlands and Other Waters**

Compensation may be a combination of onsite restoration/creation, offsite restoration, or mitigation credits. Compensation ratios (number of acres restored or created for every 1 acre filled) will be based on site-specific information and determined through coordination with state and federal agencies, as part of the permitting process for the project. Concurrent measures such as working when a site is dry (seasonal avoidance) and erosion control BMP's along with post-project mitigation measures will be implemented.

### **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 DFW 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. DFW 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.

### **Minimize Effects of Nighttime Construction Lighting**

To minimize effects on nocturnal species such as Pacific fisher and American martin, if night work is required, the lighting will be directed downward toward the roadway and will not substantially exceed the level of disturbance of the existing traffic headlights.

### **Contact and Consult with DFW and Forest Service if Nesting Osprey Are Found**

If osprey are found to be nesting in or near the project area at the time of construction, the Department will contact DFW and Forest Service, and consult with those agencies to identify and implement avoidance and minimization measures.

### **Limit Vegetation Removal to the Non-Nesting Season for Migratory Birds**

In compliance with the MBTA, grass, tree, and shrub removal will take place between September 1 and March 1 to avoid impacts on nesting birds. If vegetation must be removed outside these dates, a biological survey for nesting birds must be conducted prior to vegetation removal.

### **Limit Construction in Watercourses to the Dry Season**

Work involving seasonal creeks/drainages will take place when they are dry and there is no precipitation occurring or anticipated. Work in the water of perennially flowing channels will take place during the dry season, generally between June 15 and October 15, to minimize impacts on amphibians and other aquatic organisms.

### **Conduct Pre-Construction Surveys for Western Pond Turtle**

Measures will be implemented to minimize impacts on western pond turtles that may be present in the work area. Every day, prior to any in-stream work with active water flow, a Biological Monitor will survey for turtles in the area. If any are found, they will be moved to similar habitat downstream. Gravel or any other material added to the stream for construction purposes will be introduced slowly starting upstream giving turtles an opportunity to escape downstream.

### **Conduct Pre-Construction Surveys for Northern Red-Legged Frog**

Measures will be implemented to minimize impacts on northern red-legged frogs that may be present in the work area. Every day, prior to any in-stream work with active water flow, the Biological Monitor will survey for frogs and frog egg masses in the area. If any are found, they will be moved to similar habitat downstream. Gravel or any other material added to the stream for construction purposes will be introduced slowly, starting upstream to give frogs an opportunity to escape downstream.

### **Conduct Pre-Construction Surveys for Foothill Yellow-Legged Frog**

Measures will be implemented to minimize impacts on foothill yellow-legged frogs that may be present in the work area. Every day, prior to any in-stream work with active water flow, the Biological Monitor will survey for frogs and frog egg masses in the area. If any are found, they will be moved to similar habitat downstream. Gravel or any other material added to the stream for construction purposes will be introduced slowly, starting upstream to give frogs an opportunity to escape downstream.

### **Implement Avoidance and Minimization Measures for Chinook Salmon and Salmonids**

The Department will avoid and minimize potential impacts on the salmonids and their Critical Habitat and EFH to the greatest extent practicable during project construction. Specific work windows and limitations on construction will be determined through consultations with resource agencies. To avoid, minimize, and offset impacts, the following measures will be included by the Department:

- Large woody debris obtained from tree removal in the project area will be made available to resource agencies for placement in nearby streams and rivers. This will have a positive effect on fish rearing habitat.
- All trees not taken by resource agencies or used by other government or private entities, with approval from the Department, will be put through a chipper and the chips will be applied to areas of exposed soil on-site as erosion control mulch.
- Sediment and erosion control measures will be implemented to minimize sediment discharge to the river or other waters.
- A vacuum sweeper will be used to clean the pavement.
- No material will be placed where it may enter the river due to precipitation.
- Noise blankets are being considered to help reduce the noise from blasting at the Narrows.
- If feasible during blasting activities at the Narrows, K-rail will be placed near the centerline, and a cyclone fence will be placed on top of that.
- No impact pile driving will be used for bridge work or retaining walls.
- There will be no instream activity in the Middle Fork Smith River.
- Debris resulting from bridgework at Patrick Creek Narrows Location 2 will be contained to the maximum extent practicable.

### **Implement Avoidance and Minimization Measures for Coastal Cutthroat Trout**

The Department will avoid and minimize potential impacts on the coastal cutthroat trout and its habitat during project construction by the measures outlined above for chinook salmon so there will be no adverse impacts on coastal cutthroat trout.

### **Protect Migratory Birds**

Per the Federal MBTA, the contractor will be instructed that migratory birds and their (active) nests, eggs, and young are protected and measures must be implemented to avoid the harassment or take of any birds. These measures include:

- Tree and shrub removal should occur from September 1 to March 1 to avoid taking nesting birds.
- If vegetation removal cannot occur within this window, then surveys by the Department Biologist or biological monitor will be required prior to the removal of any trees.

- If nesting birds are present, tree and shrub removal will not be permitted until a Department Biologist or biological monitor has given authorization to proceed.

### **Use Removed Trees and Stumps to Improve Fish Rearing Habitat**

Large trees and stumps that are removed in the project area will be made available to resource agencies for placement in nearby streams and rivers. This will have a positive effect on fish rearing habitat.

### **Implement Measures to Minimize Impacts on Reptiles and Amphibians**

Measures will be implemented to minimize impacts on western pond turtles and special-status frogs that may be present in the work area. Every day prior to any drainage work that involves a watercourse with active water flow, the Biological Monitor will survey for frogs and turtles in the area. If any are found, they will be moved to similar habitat nearby.

Every day, prior to any in-stream work with active water flow, the Biological Monitor will survey for western pond turtles, frogs, and frog egg masses in the area. If any are found, they will be moved to similar habitat downstream. Gravel or any other material added to the stream for construction purposes will be introduced slowly, starting upstream to give frogs an opportunity to escape downstream.

### **Construct During Specific Work Windows to Protect Marbled Murrelet and Northern Spotted Owl**

To avoid adverse effects to northern spotted owl during the critical breeding season (March 1–June 30), no night work will take place and there will be no blasting. To avoid potential noise impacts on migrating marbled murrelet between March 24 and September 15, there will be no construction activity involving equipment with noise levels in excess of ambient traffic noise (including blasting) in the morning for a 3-hour period, starting 1 hour before sunrise and lasting until 2 hours after sunrise. In the evening, no construction activity (including blasting) will occur in a 3-hour window beginning 2 hours before sunset and lasting until 1 hour after sunset. Therefore, from July 1 to September 15, there can be night work starting 1 hour after sunset and ending 1 hour before sunrise. After September 15 (until March 1), there will be no restrictions on night work. Final work windows will be determined through Section 7 consultation and may include additional restrictions or restrictions based upon noise levels and frequency.

### **Avoid and Minimize Impacts on Salmonids**

The Department will avoid and minimize potential impacts on salmonids and their critical habitat and EFH to the greatest extent practicable during project construction. To avoid, minimize, and offset impacts, the following measures will be implemented by the Department:

- Large woody debris obtained from tree and stump removal in the project area will be made available to resource agencies for placement in nearby streams and rivers. This will have a positive effect on fish-rearing habitat.

- All trees not taken by resource agencies or used by other government or private entities, with approval from the Department, will be put through a chipper and the chips will be applied to areas of exposed soil on-site as erosion control mulch.
- Sediment and erosion control measures will be implemented to minimize sediment discharge to the river or other waters.
- A vacuum sweeper will be used to clean the pavement.
- No material will be placed where it may enter the river.
- Noise blankets will be considered to help reduce the noise from blasting at the Narrows.
- If feasible during blasting activities at the Narrows, K-rail segments will be placed near the centerline and a cyclone fence will be placed on top of that.
- No impact pile driving will be used for bridge work or retaining walls.
- There will be no activity in the active channel of the Middle Fork Smith River.
- All debris resulting from bridgework at Patrick Creek Narrows Location 2 will be contained and not allowed to enter the river.

### **Limit Timing of Construction Activity to Avoid Noise Effects on Migrating Marbled Murrelet**

To avoid potential noise impacts on migrating marbled murrelet between March 24 and September 15, there will be no construction activity (including blasting) in the morning for a 3-hour period, starting 1 hour before sunrise and lasting until 2 hours after sunrise. In the evening, no construction activity involving equipment with noise levels in excess of ambient traffic noise (including blasting) will occur in a 3-hour window starting 2 hours before sunset and lasting until 1 hour after sunset. Therefore, from July 1 to September 15, there can be night work starting 1 hour after sunset and ending 1 hour before sunrise. After September 15 (until March 1), there will be no restrictions on night work. Final work windows will be determined through Section 7 consultation, and may include additional restrictions or restrictions based upon noise levels and frequency.

### **Use Removed Trees and Stumps to Improve Fish Rearing Habitat**

Large trees and stumps that are removed in the project area will be made available to resource agencies for placement in nearby streams and rivers. This will have a positive effect on fish rearing habitat.

### **Implement Measures to Reduce Spread of Invasive Plant Species**

To reduce the spread of invasive non-native plant species, the Department may implement the following protection measures, in compliance with Executive Order 13112, to the greatest degree practicable:

- Excess excavated soil and plant materials will be disposed of at an appropriately permitted disposal site in compliance with all federal, state, county, and local regulations.

- Plant species used for erosion control will consist of native, non-invasive, regionally appropriate species or non-persistent hybrids that will serve to stabilize site conditions and prevent invasive species from colonizing.
- Certified weed-free imported materials (or rice straw in upland areas) will be used.
- If invasive weeds in areas disturbed by project activities show evidence of spreading into other areas, the Department will develop an Invasive Weed Eradication Plan that targets identified invasive species on the Cal-IPC and CNPS lists. Herbicide use is not permitted at the US 199 locations adjacent to Forest Service land, but it is permitted at the SR 197 locations. To avoid the spread of invasive plants, any wheeled or tracked equipment that is operated off pavement will be washed before entering and after leaving the project impact area.

### **Implement Invasive Weed Control Program**

As a compensatory measure to improve habitat for native plants in and adjacent to disturbed soil areas at the project locations and to minimize competition from non-native/invasive plants, the Department will implement an invasive weed control program in the Middle Fork Smith River Watershed.

### **Implement Measures to Reduce Temporary Access and Circulation Impacts**

The following measures would reduce impacts related to temporary access and circulation delays during construction:

- Access to side roads and residences would be maintained at all times. When work or traffic queues extend through an intersection or driveway, additional traffic control will be required at the intersection or driveway.
- The Department Resident Engineer would provide information to residents, businesses, and adjacent landowners (e.g., Jedediah Smith Redwoods State Park, Forest Service) before and during project work that may represent a negative impact on commerce and travel surrounding the zone of construction. Funding will be included in supplemental funds for the Resident Engineer to print flyers.
- The ODOT public information officer will be contacted 1 week before any planned closure on US 199 to allow ODOT to warn public traffic of the possible delays on the US 199 corridor.
- Prior to construction of project improvements each construction season, contact would be made with staff at Jedediah Smith Redwoods State Park to advise them of the potential length and timing of any closures of US 199 and to determine the exact dates of any festivals in the park that might be affected by the closure.

In addition to implementing measures for specific project sites, the following measures would reduce the temporary access and circulation impacts of the project caused by potentially lengthy construction delays and highway closures:

- The traffic management plans for each project location would require that emergency service providers (i.e., sheriff, fire, and ambulance services) be given at least 1 week of notice before any planned full roadway closures on US 199 during construction. Notification is particularly critical for highway closures at Patrick Creek Narrows Location 2, and the Washington Curve site, and for potentially lengthy delays at the Narrows site. Construction Contractors would be required by the Department to expedite the passage of emergency service vehicles through work zones at all times.
- Information regarding delays and scheduled closures would be made readily available to the traveling public on the internet through the Department's California Highway Information Network (CHIN), and other sources. It is recommended that the website dedicated to the proposed project be maintained to provide additional information to the public regarding the status of the projects, planned night time full roadway closures, etc. The address of this website would be included in all media advisories.
- The Department would use regional media (e.g., newspapers and radio stations) to advise the public of closures or lengthy delays at Patrick Creek Narrows Locations 1 to 3, The Narrows site, and the Washington Curve site. Media advisories on full highway closures should be provided at least 1 week in advance of closures.
- Coordination with sponsors of projects near the project sites would be required to avoid conflicts with other projects. This coordination needs to extend to other Department projects and projects that may be undertaken by Del Norte County and other agencies.
- In addition to notification of emergency service providers, the Department would notify Pelican Bay State Prison before any full closures on US 199 at least 1 week in advance. The prison occasionally transports prisoners in multi-car convoys, and convoy delays at construction sites could pose security and logistical problems for prisoner transportation (Hablitzel pers. comm.).

The following recommended measure would reduce potential effects on trucking and shipping businesses from construction delays and closures of US 199:

- The Department would coordinate with regional trucking firms and major shippers to ensure that these businesses are notified of major delays and planned highway closures so that shipments can be rescheduled or alternative trucking routes used. To the extent possible, notification would be provided through electronic communications (e.g., email).

### **Implement Additional Measures to Reduce Temporary Access and Circulation Impacts**

The following recommended measures would further reduce the temporary access and circulation impacts of the project caused by potentially lengthy construction delays and highway closures:

- Bicyclists would be accommodated through the work zone. For a lane closure controlled by flaggers, bicyclists would be instructed to join the traffic queue. For a lane closure controlled by a signal, signal timing would be adjusted to accommodate bicyclists.
- When pedestrians are found to use construction areas, they would be transported through the work zone using a pilot vehicle, vehicle transport, or other appropriate method.

- The TMPs for each project location would require that emergency service providers (e.g., sheriff, fire, and ambulance services) be given at least 1 week of notice before any planned full roadway closures on US 199 during construction. Notification is particularly critical for highway closures at Patrick Creek Narrows Locations 1 to 3 and the Washington Curve site, and for potentially lengthy delays at The Narrows site. Construction Contractors would be required by the Department to expedite the passage of emergency service vehicles through work zones at all times.

### **Maintain Access to Parks and Recreational Facilities**

Construction Contractors would be required to maintain access to recreation sites on or accessed from SR 197 and US 199, including day-use areas, campgrounds, trailheads, and access points to the Smith River and Middle Fork Smith River to maintain availability of recreational opportunities during construction.

### **Limit Construction to Non-Holiday Periods**

Construction would not occur on weekends (beginning after 3 p.m. on Fridays), designated legal holidays, or the day preceding designated legal holidays, thus reducing impacts on recreationists during these peak use periods.

### **Implement Measures to Minimize Effects on Ruby Van Deventer County Park**

Coordination with the Del Norte County Parks Department would provide an opportunity for the county to review and comment on the temporary construction easement and impacts at Ruby Van Deventer County Park. In addition to the minimization measures listed above, measures specific to Ruby Van Deventer County Park would reduce the temporary effects on the park and visitors during construction at the Ruby 1 site.

- The Department will coordinate with the Del Norte County Parks Department to ensure that, to the extent feasible, construction would avoid impacts on as many park visitors as possible.
- Access to the recreation areas in the park, including the campground, picnic area, day-use area, and banks along the Smith River would be maintained at all times during construction period to allow for continued recreational use.
- The construction zone at the entrance would not use more than three to four parking spaces over an anticipated period of three days to minimize the number of spaces unavailable for visitor use.
- The entrance would be paved and fully restored to a condition as good as or better than that which existed before the proposed project. The entrance will be restriped and any modifications or inadvertent damage to the parking lot or other park property would be restored to the condition that existed before the construction activities.

The proposed minimization measures will be refined and additional measures may be added based on input from the County. A letter to the Del Norte County Parks Department regarding the temporary construction easement and the potential impacts on the park was submitted by the Department (see Chapter 4).

### **Coordinate with the Forest Service to Minimize Effects on Smith River NRA and Middle Fork Smith River**

Coordination with the Forest Service regarding the potential effects on the Smith River NRA and Middle Fork Smith River would minimize effects on recreation facilities and opportunities along US 199 by providing an opportunity for the Forest Service to review and comment on the temporary construction impacts on the Smith River NRA and Middle Fork Smith River. Proposed minimization measures will be refined and additional measures may be added based on Forest Service input. A letter to the Forest Service requesting concurrence with the *de minimis* impact findings on the Smith River NRA, temporary occupancy of the Middle Fork Smith River, and Wild and Scenic Rivers Coordination was submitted by the Department (see Chapter 4).

Measures identified to reduce community impacts, traffic and transportation, air quality, and noise would also reduce effects related to parks and recreational facilities. These measures are:

### **Implement NCUAQMD's Rule 104 Prohibitions, Section 4.0, to Control Fugitive Dust Emissions**

The Department's Standard Specifications, and special provisions specifically require compliance by the Contractor with all applicable laws and regulations related to air quality, including air pollution control district or air quality management district regulations and local ordinances. The Construction Contractor will be required to implement measures to reduce construction-related fugitive dust emissions. The applicable requirements from the NCUAQMD Rule 104 Prohibitions, Section 4.0, are described below:

- No person shall do or allow handling, transporting, or open storage of materials in such a manner which allows or may allow unnecessary amounts of particulate matter to become airborne.
- Reasonable precautions shall be taken to prevent particulate matter from becoming airborne, including, but not limited to, the following provisions:
  - Covering open-bodied trucks when used for transporting materials likely to give rise to airborne dust.
  - The use of water or chemicals for control of dust in the demolition of existing buildings or structures, construction operations, the grading of roads, or the clearing of land.
  - The application of asphalt, oil, water or suitable chemicals on dirt roads, materials stockpiles, and other surfaces which can give rise to airborne dusts.
  - The paving of roadways and their maintenance in a clean condition.
  - The prompt removal of earth or other track out material from paved streets onto which earth or other material has been transported by trucking or earth moving equipment, erosion by water, or other means.

## **Employ Noise- and Vibration-Reducing Construction Measures**

Implementation of the following possible measures, among others, would minimize the temporary noise and vibration impacts from construction:

- Using sound-control devices on all equipment that are no less effective than those provided on the original equipment by the manufacturer. No internal combustion equipment will have an unmuffled exhaust.
- Implementing appropriate additional noise mitigation measures as directed by the Department, including changing the location of stationary construction equipment to ensure it is as far away from sensitive receptors as possible, turning off idling equipment, rescheduling construction activity during the daytime and/or a season that has the least impact on sensitive receptors, notifying adjacent residents in advance of construction work, and installing acoustic barriers around stationary construction noise sources.
- Scheduling substantial noise-generating activity during daytime hours where feasible.
- Designating construction staging areas as far as practical from receivers likely to fall within the higher ranges of ground and air vibrations from construction work..
- Performing a pre-blast condition survey of all buildings, structures, and utilities within 1,000 feet of proposed controlled blasting activity. The survey will distinguish different types of existing cracks in structures—cosmetic and structural—by means of camera or video.
- Employ measures to control airblast and ground vibration from controlled blasting such that airblast and ground vibration does not exceed USBM standards for airblast and ground vibration whenever practicable. Such measures include reducing the quantity of explosive, modifying the confinement of explosive energy, modifying the powder factor, timing and spatial distribution of blasts, and using alternative methods such as high pressure gas methods to split rock.
- Conducting airblast and ground vibration monitoring at receivers within 1,000 feet of proposed controlled blasting using seismographs capable of recording PPV in three mutually perpendicular axes and which have a fourth channel for recording airblast. The frequency response of the instrumentation will be from 2 to 250 Hz, with a minimum sampling rate of 1,000 samples per second per channel. The recorded data must be such that the frequency of the vibrations can be determined readily. If controlled blasting is found to exceed USBM standards for ground vibration and airblast, controlled blasting will cease and alternative controlled blasting or excavation methods will be employed that result in the USBM standards not being exceeded.
- Responding to and investigating all complaints of disturbance.

## **Notify Emergency Service Providers 1 Week before Highway Closures during Construction**

The TMPs for each project site would require that emergency service providers (e.g., sheriff, fire, Office of Emergency Services, and ambulance services) be given at least 1 week of notice before US 199 is closed during construction. Notification is particularly critical for highway

closures at Patrick Creek Narrows Locations 1 to 3 and the Washington Curve site and for potentially lengthy delays at The Narrows site.

Construction Contractors would be required by the Department to expedite the passage of emergency service vehicles through work zones at all times.

### **Notify Pelican Bay State Prison before Highway Closures during Construction**

In addition to notification of emergency service providers, the Department would notify Pelican Bay State Prison before closures of US 199. The prison occasionally transports prisoners in multicar convoys, and convoy delays at construction sites could pose problems for prisoner transportation (Hablitzel pers. comm.).

### **Limit Construction on SR 197 to Daylight Hours**

Construction activities scheduled to occur after 6 p.m. or on weekends would not continue past daylight hours (which vary according to season). This will reduce the amount of construction experienced by viewer groups because most construction activities will occur during business hours (when most viewer groups are likely at work), and it will eliminate the need to introduce high-wattage lighting sources to operate in the dark.

### **Implement Measures to Ensure Worker Safety during Blasting Operations**

Blasting operations must comply with federal, state, and local blasting regulations. Regulations containing specific Cal/OSHA requirements for blasting activities include Title 8, California Code of Regulations, Ch 4, Subchapter 7, Group 18: "Explosive Materials. Controlled blasting would be directed by a licensed blaster in accordance with Cal/OSHA regulations and any environmental constraints." Department provisions for blasting and the use of explosives are found in the 2006 Standard Specifications, Section 7-1.10; 2006 SSP 19-700 (05-01-06); 2006 SSP 19-705 (11-21-08); 2006 SSP 19-706 (11-21-08); 2010 Standard Specifications Section 19-2.03E, 2010 SSP 19-4\_X1 (05-20-11), and 2010 SSP 19-4\_X2 (05-20-11).

### **Implement Measures to Ensure Worker Safety from Rock Fall during Construction of Cut Slopes**

During construction of the cuts at Patrick Creek Narrows Location 2, The Narrows, and at Washington Curve, rock scaling, construction of temporary rockfall barriers, and/or monitoring of the slopes would be required prior to and during construction to minimize the risk of injury to workers.

### **Potential to Expose Workers to Naturally Occurring Geologic Hazardous Materials during Construction**

During construction at Patrick Creek Narrows Location 1 and the Washington Curve site, the Contractor will be required to comply with Department and State standards to protect health and safety of workers and the traveling public when working with potentially hazardous materials,

including naturally occurring asbestos. Details on NOA and avoidance, minimization, and mitigation measures are discussed in Section 2.2.4, “Hazardous Waste/Materials.”

### **Potential for Debris to Enter the River during Bridge Demolition**

If a bridge replacement alternative is selected at Patrick Creek Location 2, demolition and debris containment standards must be met. A containment system would be constructed to catch material and contain it during demolition. Concrete would be separated from steel, then loaded into trucks and removed as it was collected. Most debris would be recycled at a permitted commercial facility. Concrete could also be disposed of at permitted disposal sites.

### **Potential for Construction-Related Soil Erosion and Sedimentation**

Contractors will be required to implement a SWPPP in compliance with SSP 07-345 and Order 99-06-DWQ. The SWPPP will specify BMPs that will be implemented to control runoff, accelerated wind and soil erosion, and sedimentation during construction, and to stabilize the project area once construction is complete.

### **Health and Safety for Workers and the Traveling Public**

The Contractor will be required to comply with Department and State standards to protect health and safety of workers and the traveling public when working with potentially hazardous materials, including LCP, soils containing ADL, ACMs, NOA, and TWW. The Contractor will be required to comply with Department and State standards regarding transport and storage of hazardous materials that are used or stored during construction.

### **Aerially Deposited Lead, Lead Paint Systems, and Pavement Striping and Marking Handling**

In accordance with the Department’s safety requirements for lead compliance, the Contractor will be required to prevent or minimize worker exposure to lead while managing and handling earth materials, paint system debris, traffic stripe residue, and pavement marking residue containing lead. Additionally, the Contractor must comply with specific Cal/OSHA requirements when working with lead including Title 8 CA Code of Regulations § 1532.1. The Contractor is required to submit a Lead Compliance Plan to the Engineer for authorization. The authorized lead compliance provisions will be approved by a Certified Industrial Hygienist and implemented by the Contractor to address worker safety issues due to lead, dust control, and material disposal.

Applicable provisions for handling ADL include 2006 Amendments to Standard Specifications Section 7-1.07 (01-20-12), 2006 SSP 15-027 (06-05-09), 2010 Standard Specification 1-1.07B, 2010 SSP 7-1.02K(6)(j)(iii) (05-20-11), 2010 SSP 14-11.03 (01-20-12), and 2010 SSP 14-11.04 (05/20/11).

Applicable provisions for handling existing lead paint systems include 2006 Amendments to Standard Specifications Section 7-1.07 (01-20-12), 2006 SSP 15-025 (01-20-12),

Applicable provisions for handling lead in existing striping and pavement markings include 2006 Amendments to Standard Specifications Section 7-1.07 (01-20-12), 2006 SSP 14-001 (01-20-12), 2006 SSP 15-301 (06-05-09), 2006 SSP 15-305 (08-05-11), 2010 SSP 14-11.07 (01-20-12), 15-1.03B (05-20-11), and 2010 SSP 15-2.02C(2) (05-20-11) and 2010 SSP 14-11.08 (01-20-12).

### **Implement the Spill Prevention Plan**

The Department has prepared a spill contingency plan, which is a part of the SWPPP. The SWPPP includes identification of procedures and response crews in the event of an accidental release of hazardous materials. The Contractor will be required to implement these plans during construction. The plans will address the proper use and storage of hazardous materials.

### **Dispose of Treated Wood Waste in Accordance with Appropriate Regulations**

The Department will require Contractors to follow regulations adopted by the DTSC when managing TWW to prevent releases of hazardous chemical preservatives, scavenging, and exposure to people, aquatic life, and animals. The Alternative Management Standards to TWW regulations by DTSC allow disposal at approved Class III landfills rather than a hazardous waste landfill.

Applicable provisions for handling Treated Wood Waste include 2006 Amendments to Standard Specifications Section 7-1.07 (01-20-12), 2006 SSP 14-010 (11-15-10) and 2010 SSP 14-11.09 (05-20-11).

### **Implement the Asbestos Compliance Plan and Dust Control Plan**

The Department's Standard Special Provisions pertaining to dust control and dust palliatives are required in all construction contracts and would effectively reduce and control impacts from naturally occurring asbestos and dust emissions during construction, including 2006 amendments to Standard Specifications Sections 14-9.01 and 14-9.02 (01-20-12), 2006 Standard Specifications Sections 7-1.01F, 10 and 18, 2006 SSP S5-750 (03-13-09), 2006 SSP 19-910 (06-01-11), 2010 Standard Specifications Sections 14-9.02, 14-9.03 and 18, 2010 SSP 14-11.05 (05-20-11), and 2010 SSP 49-1.03 (05-20-11). These require the Contractor to comply with North Coast Unified Air Quality Management District (NCUAQMD) rules, ordinances, and regulations.

The Contractor will also implement the CARB's Asbestos Airborne Toxic Control Measure for Construction, Grading, Quarrying, and Surface Mining Operations (2008). The applicable text of the ATCM is provided below. These requirements are spelled out in the Department's 2006 SSP S5-750 (03-13-09), 2006 SSP 19-910 (06-01-11), 2010 SSP 14-11.05 (05-20-11) and 2010 SSP 49-1.03 (05-20-11).

- **Requirements for Road Construction and Maintenance.** These requirements shall apply to roads that are not part of a construction or grading project, quarry, or surface mine project.

- No person shall conduct any road construction or maintenance activities that disturb any area that meets any criterion listed in subsections (b)(1) or (b)(2) unless all of the following conditions are met.
  - The Air Pollution Control Officer (APCO) is notified in writing at least fourteen (14) days before the beginning of the activity or in accordance with a procedure approved by the district.
  - All the following dust control measures are implemented during any road construction or maintenance activity:
    - Unpaved areas subject to vehicle traffic must be stabilized by being kept adequately wetted, treated with a chemical dust suppressant, or covered with material that contains less than 0.25% asbestos;
    - The speed of any vehicles and equipment traveling across unpaved areas must be no more than fifteen (15) miles per hour unless the road surface and surrounding area is sufficiently stabilized to prevent vehicles and equipment traveling more than 15 miles per hour from emitting dust that is visible crossing the project boundaries;
    - Storage piles and disturbed areas not subject to vehicular traffic must be stabilized by being kept adequately wetted, treated with a chemical dust suppressant, or covered with material that contains less than 0.25% asbestos; and
    - Activities must be conducted so that no track-out from any road construction project is visible on any paved roadway open to the public.
  - Equipment and operations must not cause the emission of any dust that is visible crossing the project boundaries.
- No person shall conduct any road construction or maintenance activity that disturbs the ground surface in an area that meets the criteria in subsection (b)(3) unless:
  - The APCO is notified no later than the next business day of the discovery that the area meets the criteria in subsection (b)(3); and
  - The requirements of subsections (d)(1)(B) through (d)(1)(C), are implemented within twenty-four (24) hours of the discovery.
- **Exemptions from the Requirements for Road Construction and Maintenance.** The following exemptions may apply in addition to the applicable general exemptions specified in subsection (c).
  - **Remote Locations:** The APCO may provide an exemption from the requirements of subsection (d) for any activity which will occur at a remote location.
    - The district shall grant or deny a request for an exemption within ninety (90) days of the receipt of a complete application.
    - If the request for an exemption is denied, the APCO shall provide written reasons for the denial.

The remaining text of the CARB's ATCMs can be found at the following website:  
<http://www.arb.ca.gov/toxics/atcm/asb2atcm.htm>.

## **Implement Measures to Reduce Exhaust Emissions from Off-Road Diesel-Powered Equipment**

The Construction Contractor will implement measures to reduce construction-related exhaust emissions. Appropriate measures include maintaining properly tuned engines; minimizing the idling time of diesel-powered construction equipment to 2 minutes; using alternative-fuel-powered construction equipment (i.e., compressed natural gas, biodiesel, or electric); using add-on mitigation devices such as diesel oxidation catalysts or particulate filters; using equipment that meets the CARB's most recent certification standard for off-road heavy-duty diesel engines; phasing project construction; and limiting heavy-duty equipment operating hours. The Construction Contractor may select any combination of the measures identified above. If alternative measures are to be implemented, they must be shown to achieve tangible reductions in construction-related exhaust emissions and approved by either the NCUAQMD or CARB.



Appendix F Summary of Truck Route  
Classification Legislation and  
Definitions

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# Appendix F Summary of Truck Route Classification Legislation and Definitions

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## Legislation Regarding Truck Route Classifications in California

Truck route classifications, developed out of a series of federal and state legislative acts, are summarized below.

### Federal Surface Transportation Assistance Act (STAA)

In 1982, the federal government passed the STAA. This act required states to allow “larger trucks” on the National Network, which is comprised of the Interstate system plus the non-Interstate Federal-aid Primary System. "Larger trucks" include (1) doubles with 28.5-foot trailers, (2) singles with 48-foot semi-trailers and unlimited kingpin-to-rear axle (KPRA) distance, (3) unlimited length for both vehicle combinations, and (3) widths up to 102 inches. (California Department of Transportation 2009.)

### Assembly Bill 866

In 1983, California passed Assembly Bill (AB) 866 to implement the STAA provisions. AB 866 also increased the "California Legal" vehicle length from 60 to 65 feet and its width from 8.0 to 8.5 feet. The Department then evaluated State highways, and classified as "Terminal Access" those State highways with geometric standards high enough to accommodate STAA trucks. (California Department of Transportation 2009.)

### Senate Bill 2232

In 1986, California passed Senate Bill (SB) 2232 which increased the maximum KPRA length from 38 feet to 40 feet for trailers with two or more axles. SB 2232 also directed the Department to determine which State highways could not safely accommodate trucks with a 40-foot KPRA length. In December 1989, the Department completed the report to the legislature, "Truck Kingpin-To-Rear Axle Length State Highway System Evaluation." The report states that, of the 15,166 miles comprising the State Highway System, 3,364 miles cannot accommodate a 40-foot KPRA length, and 3,185 miles cannot accommodate a 38-foot KPRA length. Those route segments that cannot accommodate a 40-foot KPRA were designated "Advisory." (California Department of Transportation 2009.)

## **Truck Route Classification Definitions**

STAA trucks are limited to the National Network, Terminal Access routes, and Service Access routes (STAA Network). "California Legal" trucks can use the STAA Network and California Legal routes. The route classifications in California are listed below.

### **National Network (Federal)**

The National Network (NN) is primarily comprised of the National System of Interstate and Defense Highways, for example I-10, I-5, and I-80. STAA trucks are allowed on the NN (California Department of Transportation 2009).

### **Terminal Access (State, Local)**

Terminal Access (TA) routes are portions of State routes, or local roads that can accommodate STAA trucks. TA routes allow STAA trucks to (1) travel between NN routes, (2) reach a truck's operating facility, or (3) reach a facility where freight originates, terminates, or is handled in the transportation process (California Department of Transportation 2009).

### **Service Access (State, Local)**

STAA trucks may exit the National Network to access those highways that provide reasonable access to terminals and facilities for purposes limited to fuel, food, lodging, and repair, when that access is consistent with safe operation. The facility must be within one road mile of an exit from the National Network and that exit must be identified by signage. (California Department of Transportation 2009.)

### **California Legal (State)**

California Legal routes are State routes that allow California Legal-size trucks. STAA trucks are not allowed on these routes because of limiting geometrics, such as sharp curves and/or lack of turn-around space. (California Department of Transportation 2009.)

### **California Legal Advisory (State)**

California law allows regulatory prohibition of a 38-foot KPRA or greater where posted in black-on-white. However, many California Legal routes cannot safely accommodate California Legal-size trucks with a KPRA less than 38 feet, due to limiting geometrics such as sharp turns and highway width. Although California Legal trucks may travel on these segments, the driver is still legally responsible for unsafe off-tracking, such as crossing the centerline or driving on shoulders, curbs and sidewalks. (California Department of Transportation 2009.) Both SR 197 and US 199 are currently classified as California Legal-Advisory truck routes.

Source: California Department of Transportation. 2009. *Truck Size & Routes*. Available: <http://www.dot.ca.gov/hq/traffops/trucks/routes/truck-routes.htm>. Revised May 2, 2012. Accessed March 18, 2013.



## Appendix G Traffic Management Plans

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## TRANSPORTATION MANAGEMENT PLAN UPDATE #1

To: TOM PHILLIPS  
Project Engineer  
Title

Date: 21JUNE 2012  
File: DN-197 PM 4.5  
EA: 01-481101  
EFIS: 0100000385  
Road widening

From: TROY ARSENEAU, Chief  
District 1 Office of Traffic Operations

### Project Information

Location:	In Del Norte county near Fort Dick at the entrance to Ruby Van Deventer County Park.	
Type of Work:	Widen existing roadway, perform superelevation modification and minor realignment.	
Anticipated Traffic Control:	Reversing traffic control. Shoulder closure.	
Estimated Maximum Delay:	5 minutes.	
Peak Hour Traffic Volumes:	300 vph.	
Lane Requirement Charts Included:	Yes.	
Work During Night Hours:	Possible.	
Number of Working Days:	39 days.	
PS&E Date:	06/15/2012.	
RTL Date:	07/15/2012.	
District Traffic Manager/ TMP Manager:	Troy Arseneau	(707) 445-6377
TMP Coordinator:	Paul Hailey	(707) 445-5213

### Anticipated Traffic Impacts

Significant traffic impacts are not anticipated provided that the following recommendations and requirements are incorporated into the project. In conformance with Deputy Directive-60, District Lane Closure Review Committee approval is not required for projects with anticipated traffic delay less than 30 minutes.

Requirement

A request for an updated Transportation Management Plan shall be made during the design phase.

Hours of Work

- See Chart No. 1 "Conventional Highway Lane Requirements" for work hour restrictions.
- The full width of the traveled way shall be open for use by public traffic for the following Special Days:

Event	Event Date	Special Days
Sea Cruise	Second Weekend in October	Friday through Monday

The contractor shall verify the actual dates for this Special Event. See Chart No. 2 "Lane Closure Restrictions for Designated Legal Holidays and Special Days" for work day restrictions.

Public Notice

- Upon receipt of notice that the roadway width, including paved shoulder, for a direction of travel will be narrowed to less than 16 ft, the Resident Engineer shall promptly notify the HQ Construction Liaison Jay Horton at (916) 322-4957.
- The District Public Information Office, (707) 445-6444, shall be contacted two weeks in advance of the start of construction.
- Any emergency service agency whose ability to respond to incidents will be affected by any lane closure must be notified prior to that closure
- Impacts to tribal land during the construction phase shall be coordinated with the affected local tribal government and other entities during the design phase. Contact Kathleen Sartorius, District 1 Native American Liaison, (707) 441-5815.
- Work shall be coordinated with the local busing system (including school buses and public systems) to minimize impact on their bus schedules.
- The Resident Engineer shall provide information to residents and businesses before and during project work that may represent a negative impact on

commerce and travel surrounding the zone of construction. Funding shall be included in supplemental funds for public information.

- Consider incorporating supplemental funds into the cost estimate for this project for an open house public meeting prior to the construction phase since this project is one of several projects that are ongoing within this corridor.
- Notify the Resident Engineer at least 5 days in advance of excavation work in the vicinity of possible Caltrans electrical facilities. The Resident Engineer shall contact the Maintenance-Electrical Supervisor at (707) 825-0590 to locate existing Caltrans underground electrical facilities.

#### Traffic Control

- One closure is permitted within the project limits.
- The W11-1 vehicular traffic sign (bicycle symbol) and the W16-1p supplemental plaque (SHARE THE ROAD) shall be placed, in each direction of travel, prior to the construction zone.
- Reversing traffic control shall be in conformance with the Caltrans Standard Plan T-13, "TRAFFIC CONTROL SYSTEM FOR LANE CLOSURE ON TWO LANE CONVENTIONAL HIGHWAYS."
  - A minimum of 12 ft of paved roadway shall be open for use by public traffic.
  - The maximum length of a reversing traffic control closure is 1000 ft.
  - Supplemental funds shall be provided in the event the Resident Engineer decides to utilize advance flaggers. All flaggers shall have continuous radio contact with personnel in the work area.
- Work that occurs within 6 ft of the edge of traveled way, on a conventional highway, shall require a shoulder closure in conformance with "Figure 6H-3. Work on Shoulders (TA-3)" in the January 13, 2012 CA MUTCD (pp. 1141 and 1142).
- A minimum of one PCMS in advance of both ends of the construction site shall be required to notify the public of the closures related to this project. One of the displayed messages shall read, "WATCH FOR BIKES".
- Access to businesses, side roads and residences shall be maintained at all times. When work or traffic queues extend through an intersection, additional traffic control will be required at the intersection.

- A minimum of one PCMS in advance of both ends of the construction site shall be required to notify the public of the closures related to this project. One of the displayed messages shall read, "WATCH FOR BIKES".
- Access to businesses, side roads and residences shall be maintained at all times. When work or traffic queues extend through an intersection, additional traffic control will be required at the intersection.
- Bicyclists shall be accommodated through the work zone. During reversing traffic control, bicyclists shall be instructed to join the vehicle
- If persons with disabilities (e.g. hearing, visual, or mobility) are found to use this facility, the temporary traffic control measures mentioned in the January 13, 2012 CA MUTCD Chapter 6D (pp. 1039-1044) shall be incorporated to accommodate disabled pedestrians through the work zone.
- COZEEP is not recommended for this project. According to the CA DOT Construction Manual Section 2-215A (9), lane closures on two-lane highways do not require COZEEP
- The following projects are anticipated to have closures within this project's work limits and shall be included in SSP 07-850: Refer to STAA project study report.

#### Contingency Plan

The contractor shall prepare a contingency plan for reopening closures to public traffic. The Contractor shall submit the contingency plan for a given operation to the Engineer within one working day of the Engineer's request. Contingencies for unanticipated delays, emergencies, etc. shall be coordinated between the RE and the Contractor.

#### Approval

Approved by:

 FOR PWH  
\_\_\_\_\_  
Transportation Management Plan Coordinator

Approved by:

  
\_\_\_\_\_  
District Traffic/ TMP Manager

TAA/cwk-mab

01-DN-197-4.5  
01-481101  
Ruby 1 Widening

21 June 2012  
Page 5

JMcGee  
AMSteele

Chart No. 1 Conventional Highway Lane Requirements																									
County: DN								Route/Direction: 197								PM: 4.5									
Closure Limits:																									
FROM HOUR TO HOUR	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mondays through Thursdays	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Fridays	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R										
Saturdays																									
Sundays																					R	R	R	R	R

Legend:

R Provide at least one 12 ft through traffic lane for use by both directions of travel (Reversing Control). The maximum closure length is 1000 ft.

No lane and/or shoulder closures allowed.

REMARKS: The full width of the traveled way shall be open for use by public traffic when construction operations are not actively in progress.

Chart No. 2: Lane Closure Restrictions for Designated Legal Holidays and Special Days										
Thu	Fri	Sat	Sun	Mon	Tues	Wed	Thu	Fri	Sat	Sun
xx	H xx									
	SD xx									
	xx	H xx								
		SD xx								
	xx		H xx	xx						
			SD xx							
	xx			H xx						
				SD xx						
				xx	H xx					
					xx	H xx				
						xx	H xx			
							xx	H xx	xx	

Legends:

	Refer to lane closure charts
xx	The full width of the traveled way shall be open for use by public traffic.
H	Designated Legal Holiday
SD	Special Day

## **TRANSPORTATION MANAGEMENT PLAN UPDATE #1**

To: TOM PHILLIPS  
Project Engineer  
NR Design, E3

Date: 18 March 2013  
File: DN-197 PM 3.7/4.0  
EA: 01-454901  
EFIS: 0100000229  
Ruby 2 - Widening

From: TROY ARSENEAU, Chief  
District 1 Office of Traffic Operations

### Project Information

Location: In Del Norte County near Fort Dick from 0.81 miles to 0.03 miles south of Ruby Vandeventer County Park.

Type of Work: Excavation, paving, and pavement striping.

Anticipated Traffic Control: Reversing traffic control.  
Shoulder closure.

Estimated Maximum Delay: 5 minutes typical.

Peak Hour Traffic Volumes: 300 vph.

Lane Requirement Charts  
Included: Yes

Work During Night Hours: Possible, but improbable.

Number of Working Days: 60 days.

PA&ED Date: April/2013

RTL Date: December/2014

District Traffic Manager/ TMP  
Manager: Troy Arseneau (707) 445-6377

TMP Coordinator: Paul Hailey (707) 445-5213

### Anticipated Traffic Impacts

In conformance with Deputy Directive-60, District Lane Closure Review Committee approval was granted for the Del Norte STAA projects with an anticipated maximum traffic delay of 90 minutes.

### Hours of Work

- See Chart No. 1 “Conventional Highway Lane Requirements” for work hour restrictions.
- The full width of the traveled way shall be open for use by public traffic for the following Special Days:

Event	Event Date	Special Days
Sea Cruise	First Weekend in October	Friday through Monday

The contractor shall verify the actual dates for this Special Event. See Chart No. 2 “Lane Closure Restrictions for Designated Legal Holidays and Special Days” for work day restrictions.

### Public Notice

- Upon receipt of notice that the roadway width, including paved shoulder, for a direction of travel will be narrowed to less than 16 ft, the Resident Engineer shall promptly notify the HQ Construction Liaison Jay Horton at (916) 322-4957.
- The District Public Information Office, (707) 445-6444, shall be contacted two weeks in advance of the start of construction.
- Any emergency service agency whose ability to respond to incidents will be affected by any lane closure must be notified prior to that closure.
- Impacts to tribal land during the construction phase shall be coordinated with the affected local tribal government and other entities during the design phase. Contact Kathleen Sartorius, District 1 Native American Liaison, (707) 441-5815.
- Work shall be coordinated with the local busing system (including school buses and public systems) to minimize impact on their bus schedules. The Del Norte County Unified School District Director of Transportation telephone number is (707) 464-0250.
- Notify the Resident Engineer at least 5 days in advance of excavation work in the vicinity of possible Caltrans electrical facilities. The Resident Engineer shall contact the Maintenance-Electrical Supervisor at (707) 463-4713 to locate existing Caltrans underground electrical facilities.

### Traffic Control

- One closure is permitted within the project limits.
- The W11-1 vehicular traffic sign (bicycle symbol) and the W16-1p supplemental plaque (SHARE THE ROAD) shall be placed, in each direction of travel, prior to the construction zone.
- Reversing traffic control shall be in conformance with the Caltrans Standard Plan T-13, “TRAFFIC CONTROL SYSTEM FOR LANE CLOSURE ON TWO LANE CONVENTIONAL HIGHWAYS.”
  - A minimum of 12 ft of paved roadway shall be open for use by public traffic.
  - The maximum length of a reversing traffic control closure is 2000 ft.
  - Supplemental funds shall be provided in the event the Resident Engineer decides to utilize advance flaggers. All flaggers shall have continuous radio contact with personnel in the work area.
- Work that requires a shoulder closure on facilities with speeds greater than 50 mph shall be in conformance with the Caltrans Standard Plan T-10A, “TRAFFIC CONTROL SYSTEM FOR LANE AND COMPLETE CLOSURES ON FREEWAYS AND EXPRESSWAYS.”
- A minimum of one PCMS in advance of both ends of the construction site shall be required to notify the public of the closures related to this project.
  - Start displaying the message on the PCMS 15 minutes before closing the lane.
- Access to businesses, side roads and residences shall be maintained at all times. When work or traffic queues extend through an intersection, additional traffic control will be required at the intersection.
- If traffic is to be placed on unpaved surfaces over night, advanced flashing beacons on the advance signing as shown in Standard Plan T-13 shall be required. Flashing beacons on all four advance signs shall be required where possible. When placing flashing beacons, care shall be taken to avoid impacting inhabited dwellings with the light.
- Bicyclists shall be accommodated through the work zone. During reversing traffic control, bicyclists shall be instructed to join the vehicle queue.

- If persons with disabilities (e.g. hearing, visual, or mobility) are found to use this facility, the temporary traffic control measures mentioned in the January 13, 2012 CA MUTCD Chapter 6D (pp. 1039-1044) shall be incorporated to accommodate disabled pedestrians through the work zone.
- COZEEP is not recommended for this project. According to the CA DOT Construction Manual Section 2-215A (9), lane closures on two-lane highways do not require COZEEP.
- The following projects are anticipated to have closures near this project and shall be used to assess cumulative corridor delay: 01-48110 (Ruby 1), 01-0B310 (Patrick Creek Slipout), 01-47940 (Patrick Creek Narrows), 01-4500U (Narrows/Washington Curve), 01-0B320 (Middle Fork Wall), 01-0B330 (Siskiyou Fork Wall), 01-0C510 (HUM/DN HFST).

Contingency Plan

The contractor shall prepare a contingency plan for reopening closures to public traffic. The Contractor shall submit the contingency plan for a given operation to the Engineer within one working day of the Engineer's request. Contingencies for unanticipated delays, emergencies, etc. shall be coordinated between the RE and the Contractor.

Approval

Approved by:

Approved by: **As Signed By TAA**  
Transportation Management Plan Coordinator  
District Traffic/ TMI Manager

TAA/pwh

CC: 1)TAArseneau, 2)JCandalot  
RMMartinelli  
LAshley  
KChuch  
JMcGee  
AMSteele

Chart No. 1 Conventional Highway Lane Requirements																													
County: DN					Route/Direction: 197 NB/SB										PM: 3.7/4.0														
Closure Limits:																													
FROM HOUR TO HOUR		24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
Mondays through Thursdays		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R			
Fridays		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R													
Saturdays																													
Sundays																									R	R	R	R	R

Legend:

- R Provide at least one 12 ft through traffic lane for use by both directions of travel (Reversing Control). The maximum closure length is 2,000 ft.
- No lane and/or shoulder closures allowed.

REMARKS: The full width of the traveled way shall be open for use by public traffic when construction operations are not actively in progress.

<b>Chart No. 2: Lane Closure Restrictions for Designated Legal Holidays and Special Days</b>										
Thu	Fri	Sat	Sun	Mon	Tues	Wed	Thu	Fri	Sat	Sun
xx	<b>H</b> xx									
	<b>SD</b> xx									
	xx	<b>H</b> xx								
		<b>SD</b> xx								
	xx		<b>H</b> xx	xx						
			<b>SD</b> xx							
	xx			<b>H</b> xx						
				<b>SD</b> xx						
				xx	<b>H</b> xx					
					xx	<b>H</b> xx				
						xx	<b>H</b> xx			
							xx	<b>H</b> xx	xx	
Legends:										
	Refer to lane closure charts									
xx	The full width of the traveled way shall be open for use by public traffic.									
<b>H</b>	Designated Legal Holiday									
<b>SD</b>	Special Day									

# TRANSPORTATION MANAGEMENT PLAN UPDATE #2

To:	BRENDA HARWELL Project Engineer NR Design E3	Date: August 7, 2012 File: DN-199 PM 20.5/25.7 EA: 01-479401 EFIS: 0100000371 Patrick Creek Narrows
From:	TROY ARSENEAU, Chief District 1 Office of Traffic Operations	

Project Information

Location:	In Del Norte County, near Patrick Creek at 3 locations, from 1.5 miles south of Patrick Creek to 5.0 miles north of Patrick Creek.	
Type of Work:	Work includes widening shoulders via retaining wall construction and replacing the Middle Fork Smith River Bridge (#01-0015).	
Anticipated Traffic Control:	Reversing traffic control with flaggers. Reversing traffic control with temporary signal system. Intermittent closure. Shoulder closure.	
Estimated Maximum Delay:	5 minutes typical at each location. 20 minutes with intermittent closure.	
Peak Hour Traffic Volumes:	420 vph.	
Lane Requirement Charts Included:	Yes	
Work During Night Hours:	Possible, but improbable.	
Number of Working Days:	500 days.	
PS&E to DOE Date:	August 15, 2012	
RTL Date:	May 1, 2013	
District Traffic Manager/ TMP Manager:	Troy Arseneau	(707) 445-6377
TMP Coordinator:	Paul Hailey	(707) 445-5213

Anticipated Traffic Impacts

Significant traffic impacts are not anticipated provided that the following recommendations and requirements are incorporated into the project. To reduce the cumulative corridor delay, District Lane Closure Review Committee approval was granted on July 16, 2012 for 2 concurrent reversing traffic control closures and a 10 minute intermittent closure.

Hours of Work

- See Chart No. 1 “Conventional Highway Lane Requirements” for work hour restrictions.
- Except during the use of a temporary signal system, the full width of the traveled way shall be open for use by public traffic for the following Special Days:

Event	Event Date	Special Days
Sea Cruise	Second Weekend in October	Friday through Monday

The contractor shall verify the actual dates for this Special Event. See Chart No. 2 “Lane Closure Restrictions for Designated Legal Holidays and Special Days” for work day restrictions.

Public Notice

- Upon receipt of notice that the roadway width, including paved shoulder, for a direction of travel will be narrowed to less than 16 ft, the Resident Engineer shall promptly notify the HQ Construction Liaison Jay Horton at (916) 322-4957.
- The District Public Information Office, (707) 445-6444, shall be contacted two weeks in advance of the start of construction.
- Any emergency service agency whose ability to respond to incidents will be affected by any lane closure must be notified prior to that closure.
- Impacts to tribal land during the construction phase shall be coordinated with the affected local tribal government and other entities during the design phase. Contact Kathleen Sartorius, District 1 Native American Liaison, (707) 441-5815.

- Work shall be coordinated with the busing system to minimize impact on their bus schedules. Contact the Del Norte Unified School District's Transportation Office at (707) 464-0250.
- The Resident Engineer shall provide information to residents and businesses before and during project work that may represent a negative impact on commerce and travel surrounding the zone of construction. Funding shall be included in supplemental funds for public information.
- Consider incorporating supplemental funds into the cost estimate for this project for an open house public meeting prior to the construction phase.
- Notify the Resident Engineer at least 5 days in advance of excavation work in the vicinity of possible Caltrans electrical facilities. The Resident Engineer shall contact the Maintenance-Electrical Supervisor at (707) 825-0590 to locate existing Caltrans underground electrical facilities.

#### Traffic Control

- A maximum of two concurrent closures are permitted within the project limits. The closures shall be separated by a minimum of 1 mile.
- The W11-1 vehicular traffic sign (bicycle symbol) and the W16-1p supplemental plaque (SHARE THE ROAD) shall be placed, in each direction of travel, prior to the construction zone.
- Reversing traffic control shall be in conformance with the Caltrans Standard Plan T-13, "TRAFFIC CONTROL SYSTEM FOR LANE CLOSURE ON TWO LANE CONVENTIONAL HIGHWAYS."
  - A minimum of 10 ft of paved roadway shall be open for use by public traffic.
  - The maximum closure length is 2,000 ft.
  - Supplemental funds shall be provided in the event the Resident Engineer decides to utilize advance flaggers. All flaggers shall have continuous radio contact with personnel in the work area.
- Work that occurs within 6 ft of the edge of traveled way, on a conventional highway, shall require a shoulder closure in conformance with "Figure 6H-3. Work on Shoulders (TA-3)" in the January 13, 2012 CA MUTCD (pp. 1141 and 1142).

- During excavation, the installation of culverts, or the installation of a temporary signal system, when reversing traffic control is in effect, the road may be closed and public traffic stopped for periods not to exceed 10 min. After each closure, all accumulated traffic shall be allowed to pass through the work before another closure is made.
- A minimum of one PCMS in advance of both ends of the construction site shall be required to notify the public of the closures related to this project.
- Access to businesses, side roads and residences shall be maintained at all times. When work or traffic queues extend through an intersection, additional traffic control will be required at the intersection.
- Bicyclists shall be accommodated through the work zone. During reversing traffic control using flaggers, bicyclists shall be instructed to join the vehicle queue. During reversing traffic control using a temporary signal system, all red timing shall be adjusted to facilitate bicyclists through the lane closure.
- If persons with disabilities (e.g. hearing, visual, or mobility) are found to use this facility, the temporary traffic control measures mentioned in the January 13, 2012 CA MUTCD Chapter 6D (pp. 1039-1044) shall be incorporated to accommodate disabled pedestrians through the work zone.
- COZEEP is recommended for this project based on risk factors associated with this project and the COZEEP Guidelines (CA DOT Construction Manual Section 2-215A). The associated risk factors include: workers exposed to traffic, speed management, and significant truck volumes.
- The following table lists projects that are anticipated to have closures within this project's work limits and shall be included in SSP 07-850.

Contract No.	Co-Rte-PM	Location	Type of Work
0B3204	DN-199-24.6	Near Patrick Creek	Construct Wall
0B3304	DN-199-26.3	Near Patrick Creek	Reconstruct Roadway
450004	DN-199-22.7/23.0	Near Patrick Creek	Widening
448304	DN-199-26.3/26.5	Near Patrick Creek	Widening

- The following projects are anticipated to have closures near this project and shall be used to assess cumulative corridor delay: EA 01-454904 (Widening) and EA 01-481104 (Widening).

### Signal System Requirements

- A temporary traffic-actuated signal system may be used to provide reversing traffic control during construction, provided the signal controller location can be such that the distance between the detector loops and the signal controller is 1000 feet or less.
- The temporary signal system shall provide an adequate parking location for a signal-maintenance vehicle. This pull-off location will allow proper access of the signal controller and the generator.
- During the use of a temporary signal system, 12-inch flashing beacons shall be installed on the three advance construction signs (W20-1, W20-4, and W3-3) shown in "Figure 6H-12 (CA). Lane Closure on a Two-Lane Road Using Traffic Control Signals (TA-12)" in the January 13, 2012 CA MUTCD (pp. 1162 and 1163). Also, include either the W1-4L warning sign or the W1-4R warning sign to guide the traveling public back into their lane.
- Electrical Maintenance (825-0590) shall be contacted 15 days in advance of picking up State-furnished Traffic Signal Controller Assemblies, and 5 days in advance of the preliminary functional field-test of the signal.
- Each signal system shall be thoroughly and satisfactorily tested by the contractor prior to scheduling turn-on. Upon successful completion of the preliminary functional field test Traffic Electrical (445-6338 or 445-6339) and Electrical Maintenance (825-0590) shall be contacted 5 days in advance of each of the anticipated traffic signal turn-on.
- The time of day of the initial turn-on shall be prior to 1:00 p.m. The Initial turn-on shall not be allowed to take place on Thursdays, Fridays, Saturdays, Sundays, designated legal holidays and within 48 hours preceding designated legal holidays.
- Traffic signal system all red flash operations shall be limited to periods allowed for lane closures listed or specified in "Maintaining Traffic" of this project's special provisions.
- In the event work is suspended or the Contractor will not be actively working for a minimum of 4 weeks, the temporary signal system shall be turned off and overhead signal heads removed.
- Electrical Maintenance shall be contacted if any signal loop detectors are damaged by construction, if the temporary signal system will be put on all red flash operation, or if the temporary signal system needs to be permanently shut

down. Signal Operations shall be notified if any temporary signal timing adjustments are needed. Any loop detectors that are damaged by the Contractor's operations shall be replaced within 24 hours.

Contingency Plan

The contractor shall prepare a contingency plan for reopening closures to public traffic. The Contractor shall submit the contingency plan for a given operation to the Engineer within one working day of the Engineer's request. Contingencies for unanticipated delays, emergencies, etc. shall be coordinated between the RE and the Contractor.

Approval

Approved by:

**As Signed By TAA**

Approved by:

District Traffic/ TMP Manager

TAA/jnl

CC: 1)TAArseneau, 2)JCandalot  
RMMartinelli  
BTFinck  
LAshley  
KChurch  
JMcGee  
AMSteele

Chart No. 1 Conventional Highway Lane Requirements																										
County: Del Norte					Route/Direction: 199 NB/SB										PM: 20.5/25.7											
Closure Limits:																										
FROM HOUR TO HOUR																										
	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
Mondays through Thursdays	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	
Fridays	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R											
Saturdays																										
Sundays																						R	R	R	R	R

Legend:

R Provide at least one 10 ft through traffic lane for use by both directions of travel (Reversing Control). The maximum closure length is 2,000 ft.

Except during the use of a temporary signal system, no lane/shoulder closures allowed.

REMARKS: Except during the use of a temporary signal system, the full width of the traveled way shall be open for use by public traffic when construction operations are not actively in progress.

Chart No. 2: Lane Closure Restrictions for Designated Legal Holidays and Special Days										
Thu	Fri	Sat	Sun	Mon	Tues	Wed	Thu	Fri	Sat	Sun
xx	H xx									
	SD xx									
	xx	H xx								
		SD xx								
	xx		H xx	xx						
			SD xx							
	xx			H xx						
				SD xx						
				xx	H xx					
					xx	H xx				
						xx	H xx			
						xx	xx	H xx		
						xx	xx	xx		
Legends:										
	Refer to lane closure charts									
xx	Except during stage construction/the use of a temp. signal system, the full width of the traveled way shall be open for use by public traffic.									
H	Designated Legal Holiday									
SD	Special Day									

## TRANSPORTATION MANAGEMENT PLAN

To: ED SPEER  
Project Engineer  
NR Design, R1

Date: 21 March 2013  
File: DN-199 PM 22.7/26.5  
EA: 01-4500U1  
EFIS: 0100020447  
Washington-Narrows STAA

From: TROY ARSENEAU, Chief  
District 1 Office of Traffic Operations

### Project Information

Location: In Del Norte County near Patricks Creek, from 0.6 miles north of Patrick Cr Rd #316 to 1.1 miles north of Siskiyou Fork Rd.

Type of Work: Widening, install drainage ditch, add rockfall catchment area, install culverts, replace guardrail, install HMA overlay, centerline rumble stripe

Anticipated Traffic Control: Reversing traffic control.  
Intermittent closure.  
Full closure without detour.  
Shoulder closure.

Estimated Maximum Delay: 5 minutes reversing.  
75 minutes full closure without detour.  
90 minute corridor delay.

Peak Hour Traffic Volumes: 420 vph.

Lane Requirement Charts  
Included: Yes

Work During Night Hours: Prohibited at The Narrows.  
Possible, but improbable, at Washington Curve.

Number of Working Days: 205 days.

PA&ED Date: April/2013

RTL Date: January/2014

District Traffic Manager/ TMP  
Manager: Troy Arseneau (707) 445-6377

TMP Coordinator: Paul Hailey (707) 445-5213

### Anticipated Traffic Impacts

District Lane Closure Review Committee approval was granted for the DN STAA projects with anticipated corridor traffic delay of 90 minutes or less. The contractor shall provide a Traffic Management Supervisor to coordinate with other projects within the U.S. 199/S.R. 197 corridor in order to ensure compliance with the maximum delay.

Further approval is required for four discrete closures of four hours each. Day, time and delay will be determined at a later date.

### Hours of Work

- See Charts No. 1-2 “Conventional Highway Lane Requirements” and Chart No. 3 “Complete Conventional Highway Closure Hours” for work hour restrictions.
- The full width of the traveled way shall be open for use by public traffic for the following Special Days:

Event	Event Date	Special Days
Sea Cruise	First Weekend in October	Friday through Monday

The contractor shall verify the actual dates for this Special Event. See Chart No. 4 “Lane Closure Restrictions for Designated Legal Holidays and Special Days” for work day restrictions.

### Public Notice

- Upon receipt of notice that the roadway width, including paved shoulder, for a direction of travel will be narrowed to less than 16 ft, the Resident Engineer shall promptly notify the HQ Construction Liaison Jay Horton at (916) 322-4957.
- The District Public Information Office, (707) 445-6444, shall be contacted two weeks in advance of the start of construction.
- Any emergency service agency whose ability to respond to incidents will be affected by any lane closure must be notified prior to that closure.
- Work shall be coordinated with the local busing system (including school buses and public systems) to minimize impact on their bus schedules.

- The Resident Engineer shall provide information to residents and businesses before and during project work that may represent a negative impact on commerce and travel surrounding the zone of construction. Funding shall be included in supplemental funds for public information.
- Consider incorporating supplemental funds into the cost estimate for this project for an open house public meeting prior to the construction phase.
- Notify the Resident Engineer at least 5 days in advance of excavation work in the vicinity of possible Caltrans electrical facilities. The Resident Engineer shall contact the Maintenance-Electrical Supervisor at (707) 463-4713 to locate existing Caltrans underground electrical facilities.

### Traffic Control

- One closure is permitted within the project limits.
- The W11-1 vehicular traffic sign (bicycle symbol) and the W16-1p supplemental plaque (SHARE THE ROAD) shall be placed, in each direction of travel, prior to the construction zone.
- Reversing traffic control shall be in conformance with the Caltrans Standard Plan T-13, "TRAFFIC CONTROL SYSTEM FOR LANE CLOSURE ON TWO LANE CONVENTIONAL HIGHWAYS."
  - A minimum of 12 ft of paved roadway shall be open for use by public traffic.
  - Supplemental funds shall be provided in the event the Resident Engineer decides to utilize advance flaggers. All flaggers shall have continuous radio contact with personnel in the work area.
- Work that requires a shoulder closure on conventional highways shall be in conformance with the Caltrans Standard Plan T-11, "TRAFFIC CONTROL SYSTEM FOR LANE CLOSURE ON MULTILANE CONVENTIONAL HIGHWAYS."
- Work that requires a shoulder closure on facilities with speeds greater than 50 mph shall be in conformance with the Caltrans Standard Plan T-10A, "TRAFFIC CONTROL SYSTEM FOR LANE AND COMPLETE CLOSURES ON FREEWAYS AND EXPRESSWAYS."
- During blasting operations, when reversing traffic control is in effect, the road may be closed and public traffic stopped for periods not to exceed 40 min.

After each closure, all accumulated traffic shall be allowed to pass through the work before another closure is made.

- A minimum of one PCMS in advance of both ends of the construction site shall be required to notify the public of the closures related to this project.
  - Start displaying the message on the PCMS 15 minutes before closing the lane.
- Access to businesses, side roads and residences shall be maintained at all times. When work or traffic queues extend through an intersection, additional traffic control will be required at the intersection.
- Gawk screens are recommended to accompany any temporary rail barrier (Type K) in order to maximize the capacity of the traveled way.
- Bicyclists shall be accommodated through the work zone. During reversing traffic control, bicyclists shall be instructed to join the vehicle queue. During reversing traffic control using a temporary signal system, all red timing shall be adjusted to facilitate bicyclists through the lane closure.
- If persons with disabilities (e.g. hearing, visual, or mobility) are found to use this facility, the temporary traffic control measures mentioned in the January 13, 2012 CA MUTCD Chapter 6D (pp. 1039-1044) shall be incorporated to accommodate disabled pedestrians through the work zone.
- COZEEP is recommended for this project based on risk factors associated with this project and the COZEEP Guidelines (CA DOT Construction Manual Section 2-215A). The associated risk factors include: workers exposed to traffic, end of queue management, speed management, and significant truck volumes.
- The following projects are anticipated to have closures near this project and shall be used to assess cumulative corridor delay: 01-49540 (Hiouchi TE), 01-0B310 (Patrick Creek Slipout), 01-47940 (Patrick Creek Narrows), 01-0B320 (Middle Fork Wall), 01-0B330 (Siskiyou Fork Wall), 01-45490 (Ruby 2), 01-48110 (Ruby 1), 01-0C510 (HUM/DN HFST).

### Signal System Requirements

- A temporary traffic-actuated signal system may be used to provide reversing traffic control during construction, provided the signal controller location can be such that the distance between the detector loops and the signal controller is 1000 feet or less.

- The temporary signal system shall provide an adequate parking location for a signal-maintenance vehicle. This pull-off location will allow proper access of the signal controller and the generator.
- During the use of a temporary signal system, 12-inch flashing beacons shall be installed on the three advance construction signs (W20-1, W20-4, and W3-3) shown in “Figure 6H-12 (CA). Lane Closure on a Two-Lane Road Using Traffic Control Signals (TA-12)” in the January 13, 2012 CA MUTCD (pp. 1162 and 1163). Also, include either the W1-4L warning sign or the W1-4R warning sign to guide the traveling public back into their lane.
- Electrical Maintenance (825-0590) shall be contacted 15 days in advance of picking up State-furnished Traffic Signal Controller Assemblies, and 5 days in advance of the preliminary functional field-test of the signal.
- Each signal system shall be thoroughly and satisfactorily tested by the contractor prior to scheduling turn-on. Upon successful completion of the preliminary functional field test Traffic Electrical (445-6338 or 445-6339) and Electrical Maintenance (825-0590) shall be contacted 5 days in advance of each of the anticipated traffic signal turn-on.
- The time of day of the initial turn-on shall be prior to 1:00 p.m. The Initial turn-on shall not be allowed to take place on Thursdays, Fridays, Saturdays, Sundays, designated legal holidays and within 48 hours preceding designated legal holidays.
- Traffic signal system all red flash operations shall be limited to periods allowed for lane closures listed or specified in “Maintaining Traffic” of this project’s special provisions.
- In the event work is suspended or the Contractor will not be actively working for a minimum of 4 weeks, the temporary signal system shall be turned off and overhead signal heads removed.
- Electrical Maintenance shall be contacted if any signal loop detectors are damaged by construction, if the temporary signal system will be put on all red flash operation, or if the temporary signal system needs to be permanently shut down. Signal Operations shall be notified if any temporary signal timing adjustments are needed. Any loop detectors that are damaged by the Contractor’s operations shall be replaced within 24 hours.

Contingency Plan

The contractor shall prepare a contingency plan for reopening closures to public traffic. The Contractor shall submit the contingency plan for a given operation to the Engineer within one working day of the Engineer's request. Contingencies for unanticipated delays, emergencies, etc. shall be coordinated between the RE and the Contractor.

Approval

Approved by:

**As Signed By TAA**

Approved by:

District Traffic/ TMP Manager

TAA/pwh

CC: 1)TAArseneau, 2)JCandalot  
RMMartinelli  
BTFinck  
JMartin  
KChurch  
JMcGee  
AMSteele

Chart No. 1 Conventional Highway Lane Requirements																										
County: DN					Route/Direction: 199 NB/SB										PM: 22.7/23.0											
Closure Limits:																										
FROM HOUR TO HOUR																										
	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
Mondays through Thursdays	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Fridays	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R											
Saturdays																										
Sundays																						R	R	R	R	R

Legend:

R Provide at least one 12 ft through traffic lane for use by both directions of travel (Reversing Control). The maximum closure length is 2,000 ft.

No lane and/or shoulder closures allowed.

REMARKS: The full width of the traveled way shall be open for use by public traffic when construction operations are not actively in progress.

Chart No. 2 Conventional Highway Lane Requirements																										
County: DN					Route/Direction: 199 NB/SB										PM: 26.3/26.5											
Closure Limits:																										
FROM HOUR TO HOUR																										
	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
Mondays through Thursdays	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Fridays	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R											
Saturdays																										
Sundays																						R	R	R	R	R

Legend:

R Provide at least one 12 ft through traffic lane for use by both directions of travel (Reversing Control). The maximum closure length is 1,000 ft.

Except during the use of a temporary signal system, no lane and/or shoulder closures allowed.

REMARKS: Except during the use of a temporary signal system, the full width of the traveled way shall be open for use by public traffic when construction operations are not actively in progress.

Chart No. 3 Complete Conventional Highway Closure Hours																										
County: DN					Route/Direction: 199 NB/SB										PM: 22.7/26.5											
Closure Limits:																										
FROM HOUR TO HOUR	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
Mondays through Thursdays	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
Fridays	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C											
Saturdays																										
Sundays																						C	C	C	C	C

Legend:

C Conventional highway may be closed completely, provided the maximum corridor delay does not exceed 90 minutes. The maximum closure length is 1.5 miles.

No complete conventional highway closure is permitted.

REMARKS: The full width of the traveled way shall be open for use by public traffic when construction operations are not actively in progress.

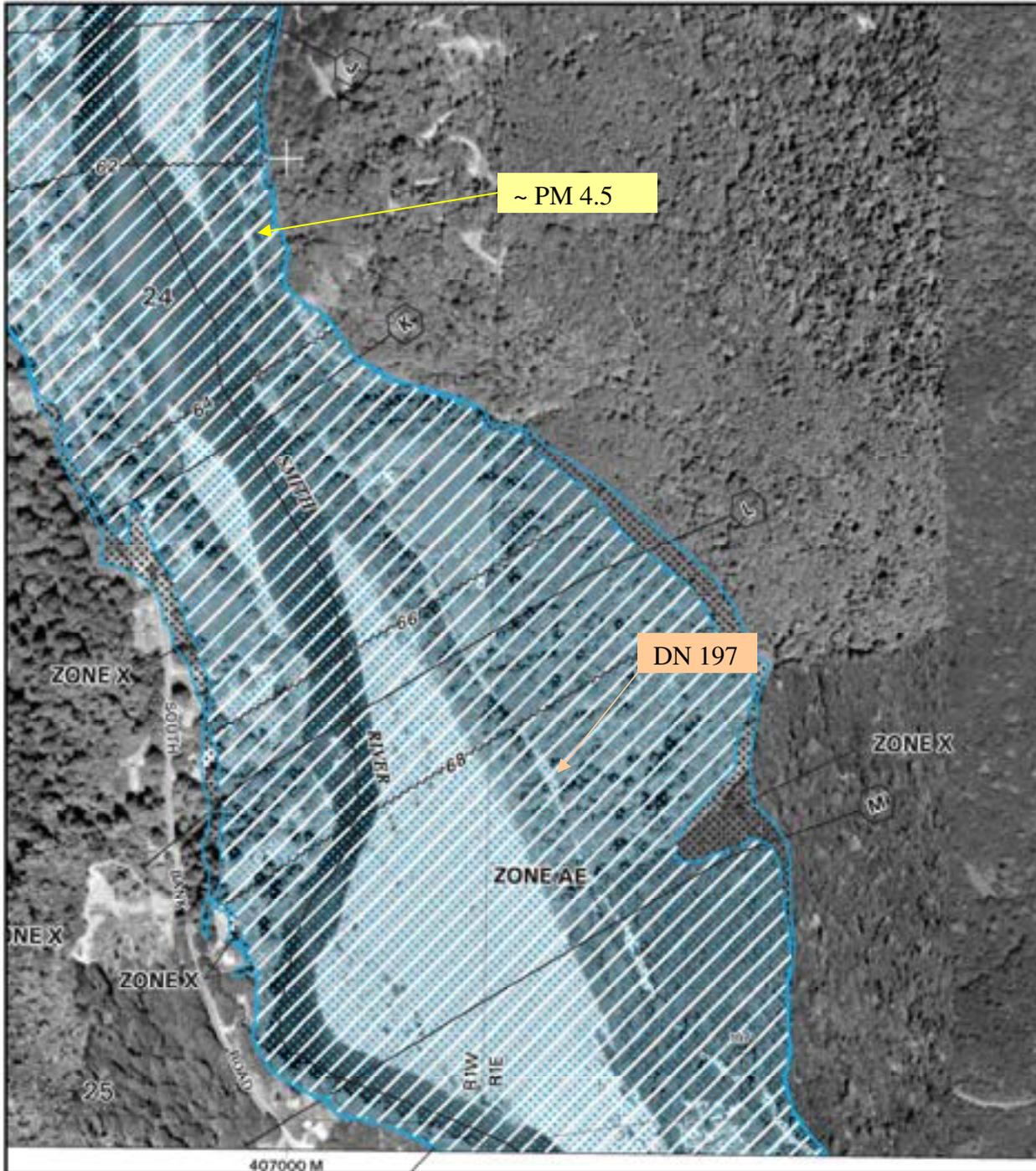
<b>Chart No. 4: Lane Closure Restrictions for Designated Legal Holidays and Special Days</b>										
Thu	Fri	Sat	Sun	Mon	Tues	Wed	Thu	Fri	Sat	Sun
xx	<b>H</b> xx									
	<b>SD</b> xx									
	xx	<b>H</b> xx								
		<b>SD</b> xx								
	xx		<b>H</b> xx	xx						
			<b>SD</b> xx							
	xx			<b>H</b> xx						
				<b>SD</b> xx						
				xx	<b>H</b> xx					
					xx	<b>H</b> xx				
						xx	<b>H</b> xx			
							xx	<b>H</b> xx	xx	
Legends:										
	Refer to lane closure charts									
xx	Except during the use of a temporary signal system, the full width of the traveled way shall be open for use by public traffic.									
<b>H</b>	Designated Legal Holiday									
<b>SD</b>	Special Day									

## Appendix H Flood Insurance Rate Maps

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FIRM Panel 06015C0226E - DN 197



Food insurance is available in this community, contact your local Flood Insurance Program at (800) 638-6620.



**MAP SCALE 1" = 500'**



**NFP**

**PANEL 0226E**

**FIRM**  
**FLOOD INSURANCE RATE MAP**  
 DEL NORTE COUNTY,  
 CALIFORNIA AND  
 INCORPORATED AREAS

**PANEL 226 OF 675**  
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
DEL NORTE COUNTY, UNINCORPORATED AREAS	06015	C0226	E

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

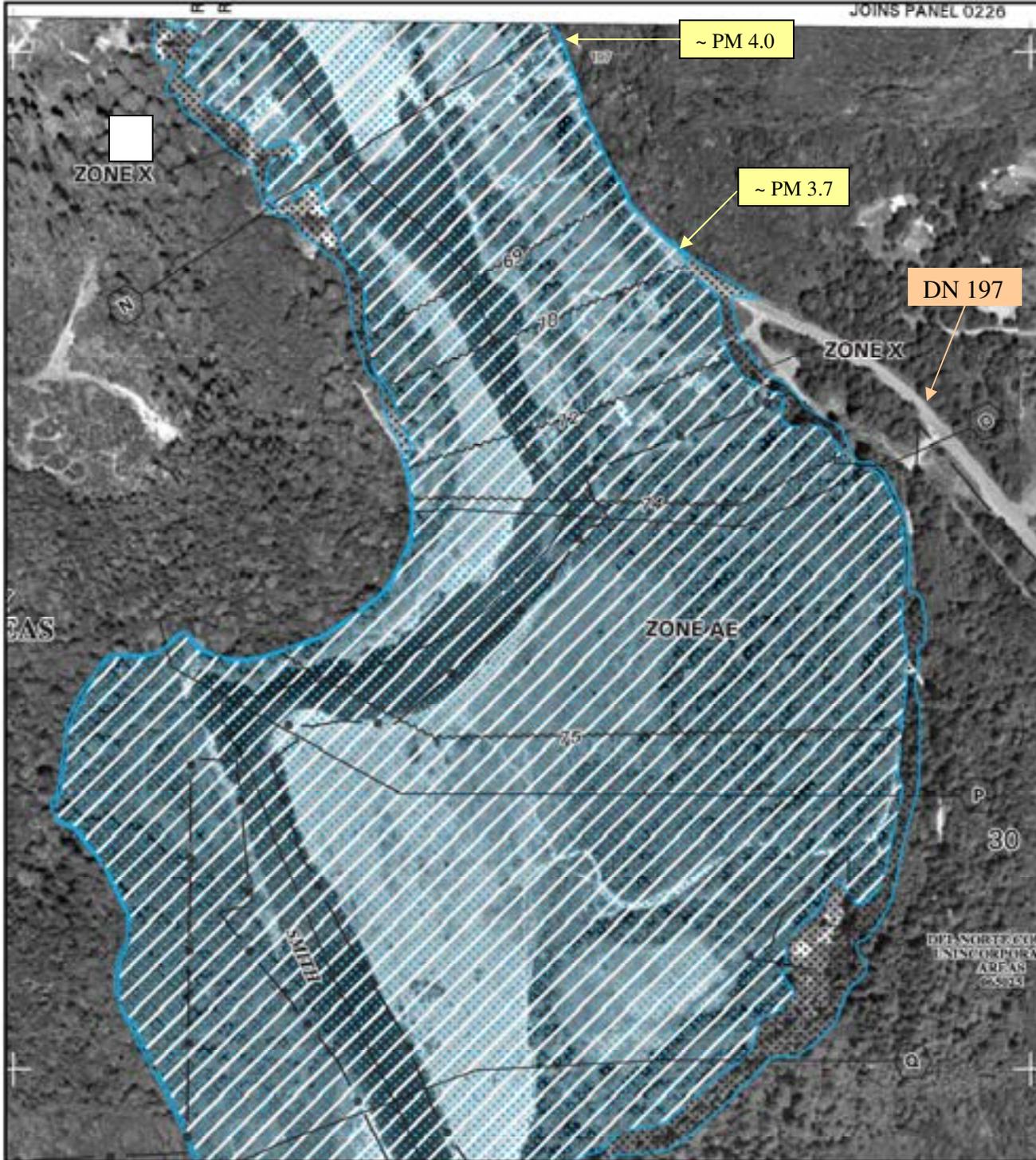
**MAP NUMBER**  
**06015C0226E**

**EFFECTIVE DATE:**  
**SEPTEMBER 26, 2008**

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov)

FIRM Panel 06015C0228E - DN 197



lood insurance is available in this community, contact your local National Flood Insurance Program at (800) 638-6620.

  
**MAP SCALE 1" = 500'**  


---

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0228E

**FIRM**  
**FLOOD INSURANCE RATE MAP**  
 DEL NORTE COUNTY,  
 CALIFORNIA AND  
 INCORPORATED AREAS

**PANEL 228 OF 675**  
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINING	NUMBER	PANEL	SUFFIX
DEL NORTE COUNTY UNINCORPORATED AREAS	06015	0228	E

Notice to User: The Map Number shown below should be used when showing FIRM areas. The Community Number shown above should be used on insurance applications for the subject community.

**MAP NUMBER**  
**06015C0228E**

**EFFECTIVE DATE:**  
**SEPTEMBER 26, 2008**

Federal Emergency Management Agency

---

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov)

## Appendix I Compliance with 40 CFR 1502.22



# Appendix I Compliance with 40 CFR 1502.22

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This text is taken from the Federal Highway Administration's *Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents*, Appendix C (Federal Highway Administration 2012).

## **Sec. 1502.22 INCOMPLETE OR UNAVAILABLE INFORMATION**

When an agency is evaluating reasonably foreseeable significant adverse effects on the human environment in an environmental impact statement and there is incomplete or unavailable information, the agency shall always make clear that such information is lacking.

- a) If the incomplete information relevant to reasonably foreseeable significant adverse impacts is essential to a reasoned choice among alternatives and the overall costs of obtaining it are not exorbitant, the agency shall include the information in the environmental impact statement.
- b) If the information relevant to reasonably foreseeable significant adverse impacts cannot be obtained because the overall costs of obtaining it are exorbitant or the means to obtain it are not known, the agency shall include within the environmental impact statement:
  1. a statement that such information is incomplete or unavailable;
  2. a statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment;
  3. a summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment; and
  4. the agency's evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community. For the purposes of this section, "reasonably foreseeable" includes impacts that have catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason.
- c) The amended regulation will be applicable to all environmental impact statements for which a Notice to Intent (40 CFR 1508.22) is published in the Federal Register on or after May 27, 1986. For environmental impact statements in progress, agencies may choose to comply with the requirements of either the original or amended regulation.

### ***INCOMPLETE OR UNAVAILABLE INFORMATION FOR PROJECT-SPECIFIC MSAT HEALTH IMPACTS ANALYSIS***

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway

alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The U.S. Environmental Protection Agency (EPA) is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is “a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects” (EPA, <https://www.epa.gov/iris/>). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of FHWA’s Interim Guidance Update on Mobile source Air Toxic Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI, <http://pubs.healtheffects.org/view.php?id=282>) or in the future as vehicle emissions substantially decrease (HEI, <http://pubs.healtheffects.org/view.php?id=306>).

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts – each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (<http://pubs.healtheffects.org/view.php?id=282>). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA (<http://www.epa.gov/risk/basicinformation.htm#g>) and the HEI (<http://pubs.healtheffects.org/getfile.php?u=395>) have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine a “safe” or “acceptable” level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA’s approach to addressing risk in its two step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than safe or acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

Due to the limitations cited, a discussion such as the example provided in this Appendix (reflecting any local and project-specific circumstances), should be included regarding incomplete or unavailable information in accordance with Council on Environmental Quality (CEQ) regulations [40 CFR 1502.22(b)]. The FHWA Headquarters and Resource Center staff Victoria Martinez (787) 766-5600 X231, Bruce Bender (202) 366-2851, and Michael Claggett (505) 820-2047, are available to provide guidance and technical assistance and support.



# Appendix J Natural Communities in the Project Area

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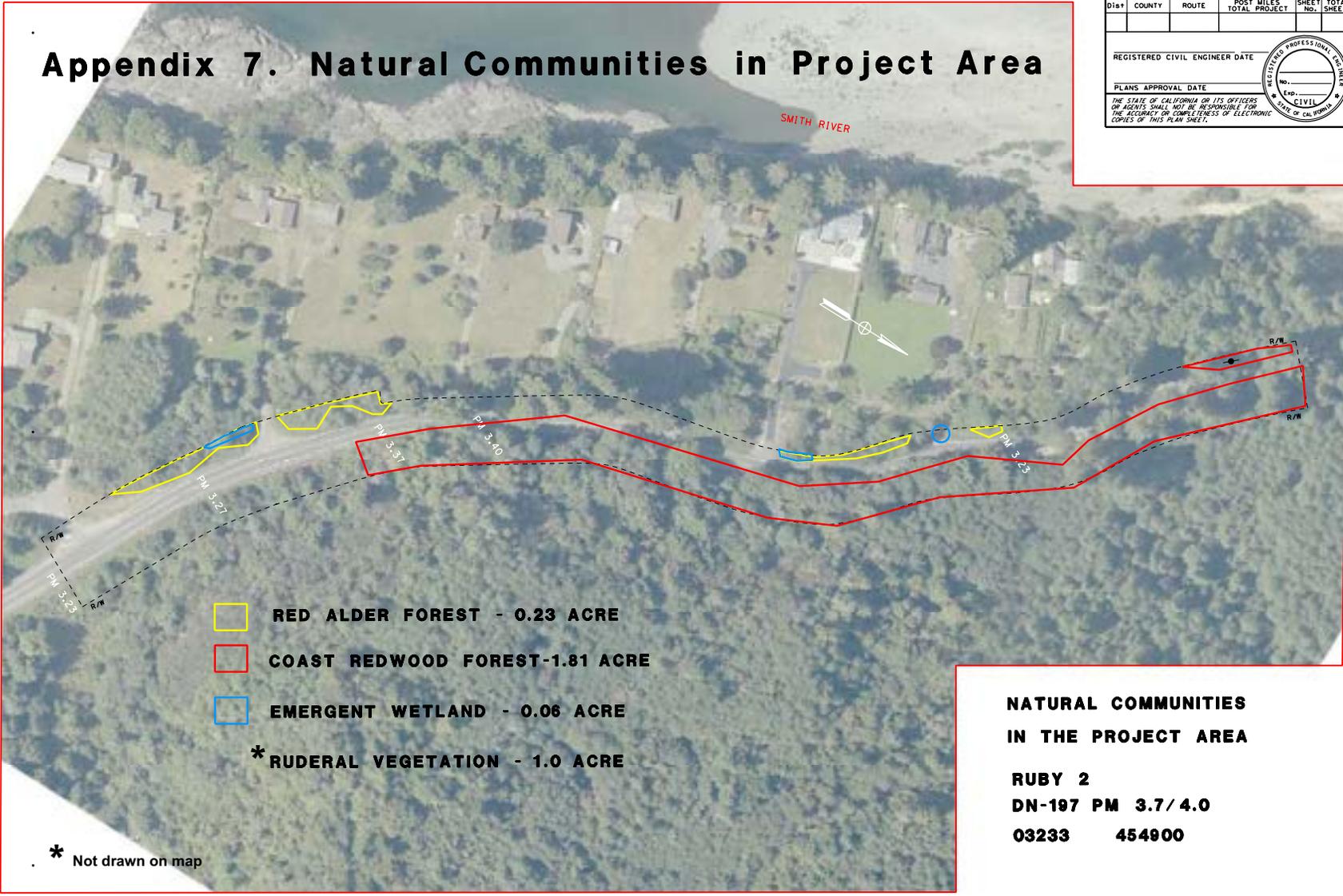
# Appendix 7. Natural Communities in Project Area

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL No. SHEETS

REGISTERED CIVIL ENGINEER DATE \_\_\_\_\_

PLANS APPROVAL DATE \_\_\_\_\_

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

- RED ALDER FOREST - 0.23 ACRE
- COAST REDWOOD FOREST-1.81 ACRE
- EMERGENT WETLAND - 0.06 ACRE
- \* RUDERAL VEGETATION - 1.0 ACRE

\* Not drawn on map

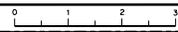
**NATURAL COMMUNITIES  
IN THE PROJECT AREA**

**RUBY 2**  
**DN-197 PM 3.7/4.0**  
**03233 454900**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
  
 FUNCTIONAL SUPERVISOR \_\_\_\_\_  
 CHECKED BY \_\_\_\_\_  
 REVISED BY \_\_\_\_\_  
 DATE REVISED \_\_\_\_\_

BORDER LAST REVISED 3/1/2007

RELATIVE BORDER SCALE 1/5 IN INCHES

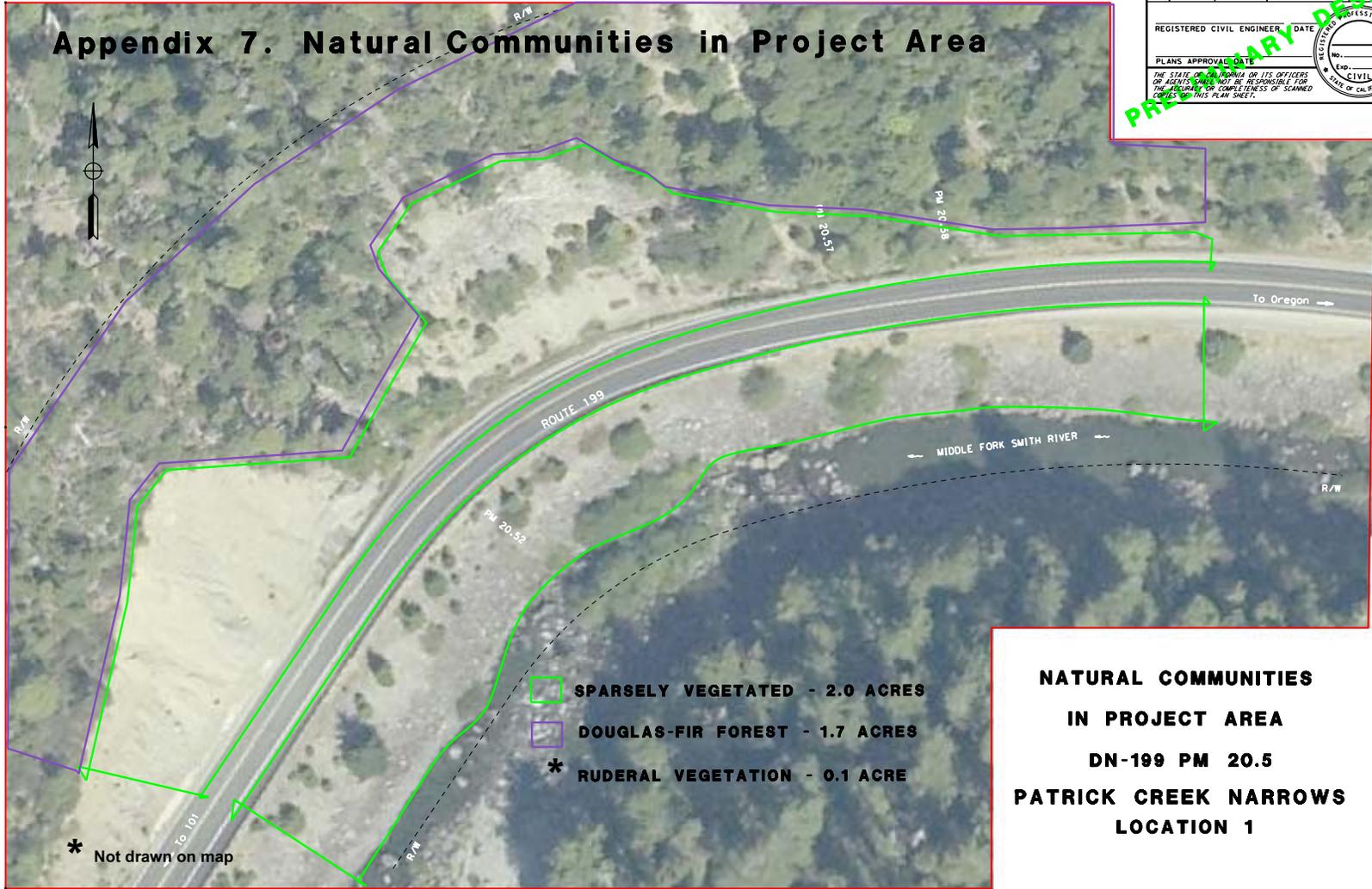


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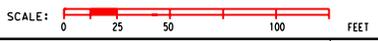
# Appendix 7. Natural Communities in Project Area



- SPARSELY VEGETATED - 2.0 ACRES
- DOUGLAS-FIR FOREST - 1.7 ACRES
- \* RUDERAL VEGETATION - 0.1 ACRE

\* Not drawn on map

**NATURAL COMMUNITIES  
IN PROJECT AREA  
DN-199 PM 20.5  
PATRICK CREEK NARROWS  
LOCATION 1**



Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL No. SHEETS

REGISTERED CIVIL ENGINEER	DATE
PLANS APPROVAL	
No.	
Exp.	
CIVIL	

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

PRELIMINARY DESIGN

REQUEST STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION DESIGN  
 FUNCTIONAL SUPERVISOR  
 CALCULATED/DESIGNED BY  
 CHECKED BY  
 REVISED BY  
 DATE REVISED

BORDER LAST REVISED 4/11/2008

RELATIVE BORDER SCALE IS IN INCHES

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DGN FILE => #REQUEST

CU 00000

EA 000000

DATE PLOTTED => #DATE  
 TIME PLOTTED => #TIME



# Appendix 7. Natural Communities in Project Area

PRELIMINARY DESIGN

DTB#	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL NO. SHEETS

REGISTERED CIVIL ENGINEER, DATE

PLANS APPROVED DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

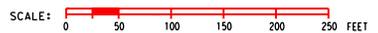
REGISTERED PROFESSIONAL ENGINEER  
No. \_\_\_\_\_  
Exp. \_\_\_\_\_  
CIVIL  
STATE OF CALIFORNIA



- RED ALDER FOREST - 0.15 ACRE
- DOUGLAS-FIR FOREST - 2.48 ACRES
- BIGLEAF MAPLE FOREST - 0.80 ACRE
- SPARSELY VEGETATED - 0.57 ACRES
- \* RUDERAL VEGETATION - 0.9 ACRE

\* Not drawn on map

**NATURAL COMMUNITIES  
IN PROJECT AREA  
DN-199 PM 26.5  
PATRICK CREEK NARROWS  
LOCATION 3**



FUNCTIONAL SUPERVISOR	REVISOR	DATE
CALCULATED-DESIGNED BY	CHECKED BY	
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	<b>DESIGN</b>	
<b>Caltrans</b>		

LAST REVISED DATE PLOTTED -> DATE  
11-22-09 TIME PLOTTED -> 9:16 AM







# Appendix K Locations of Trees 6 inches dbh and Greater in the Project Area

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# Appendix K. Results of Tree Surveys

RESULTS OF RUBY 2 TREE SURVEYS DN STAA (1 of 2)

No. of Trees	Species	dbh (inches)	Four-foot Shoulders Alternative	Two-foot Shoulders Alternative	Two-Foot Widening in Spot Locations Alternative
1	Stump	72	☉	☉	☉
1	Redwood	23	*	*	*
1	California bay	16	*	*	*
1	Redwood	126	*	*	*
2	Bigleaf maple	12	*	*	*
1	California bay	16	*	*	*
1	Redwood	60	*	*	*
1	Redwood	94	*	*	*
1	Douglas-fir	20	*	*	*
1	Redwood	144	*	*	*
1	Stump	180	☉	☉	☉
1	Redwood	14	*	*	*
1	Stump	120	☉	☉	☉
1	Red alder	17	*	*	*
1	Red alder	14	*	*	*
6	Red alder	10	*	*	*
1	Stump	120	☉	☉	☉
1	Redwood	120	*	*	*
1	Red alder	6-12	*	*	*
1	Redwood	23	*	*	*
1	Redwood	24	*	*	*
1	Redwood	6-12	*	*	*
1	Stump	144	☉	☉	☉
1	Redwood	36	*	*	*
1	California bay	24	*	*	*
1	Redwood	6-12	*	*	*
1	Stump	72	☉	☉	☉
2	Redwood	12	*	*	*
1	Redwood	48	*	*	*
1	Redwood	36	*	*	*

\*=Trees ☉=Stumps  
(Table continued on next column)

(Continued from previous column)

No. of Trees	Species	dbh (inches)	Four-foot Shoulders Alternative	Two-foot Shoulders Alternative	Two-Foot Widening in Spot Locations Alternative
1	Stump	120	☉	☉	☉
1	Stump	54	*	*	*
1	Redwood	19	*	*	*
1	Stump	96	*	*	*
1	Redwood	120	*	*	*
2	Bigleaf maple	6-12	*	*	*
1	Redwood	12	*	*	*
1	Redwood	36	*	*	*
1	Redwood	12	*	*	*
1	Redwood	31	*	*	*
1	California bay	12	☉	☉	☉
1	California bay	6-12	*	*	*
1	Redwood	6-12	☉	☉	☉
1	Redwood	48	*	*	*
1	Tanoak	48	*	*	*
1	Red alder	12	*	*	*
1	Redwood	60	*	*	*
1	Stump	60	☉	☉	☉
1	Redwood	18	*	*	*
1	Stump	48	☉	☉	☉
1	Stump	72	☉	☉	☉
1	Red alder	6-12	*	*	*
1	Redwood	16	*	*	*
1	Stump	72	☉	☉	☉
1	Redwood	6-12	*	*	*
9	Red alder	6-12	*	*	*
1	Incense cedar	6-12	*	*	*
Tree Removal/Alternative			50	23	15
Stump Removal/Alternative			12	8	4

\*=Trees ☉=Stumps

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE \_\_\_\_\_

PLANS APPROVAL DATE \_\_\_\_\_

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER  
No. \_\_\_\_\_  
Exp. \_\_\_\_\_  
CIVIL  
STATE OF CALIFORNIA

RUBY 2  
DN-197 PM 3.2/4.0

-- LEGEND --

- Two-Foot Widening in Spot Locations Alternative
- Two-Foot Shoulders Alternative
- Four-Foot Shoulders Alternative

REVISOR: \_\_\_\_\_ DATE: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_

DESIGNED BY: \_\_\_\_\_

FUNCTIONAL SUPERVISOR: \_\_\_\_\_

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

**Caltrans**

LAST REVISION: \_\_\_\_\_ DATE PLOTTED => \_\_\_\_\_  
00-00-00 TIME PLOTTED => \_\_\_\_\_







# Appendix K. Results of Tree Surveys

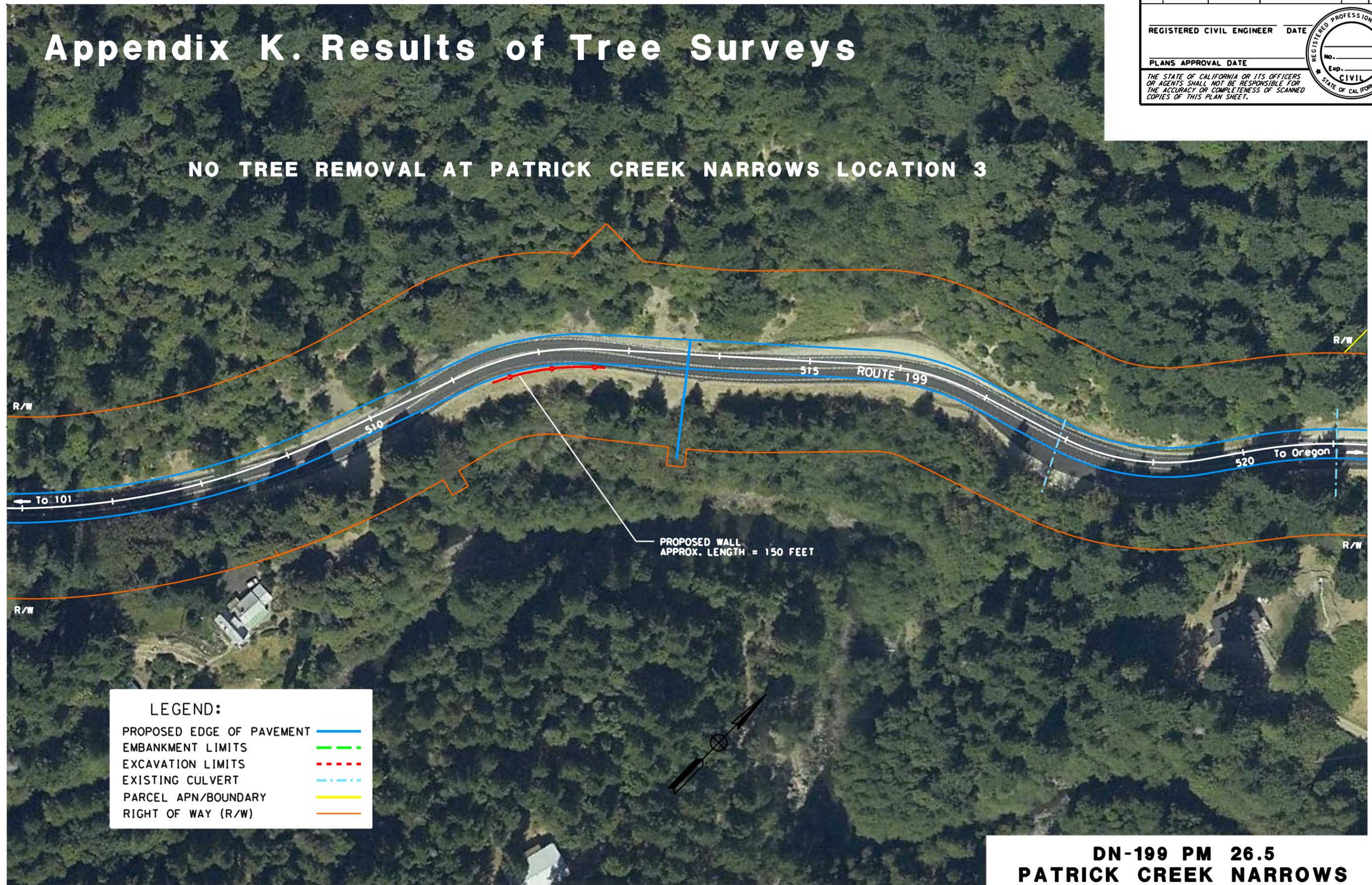
**NO TREE REMOVAL AT PATRICK CREEK NARROWS LOCATION 3**

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE \_\_\_\_\_

PLANS APPROVAL DATE \_\_\_\_\_

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**LEGEND:**

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



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

#REQUEST STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION DESIGN  
 FUNCTIONAL SUPERVISOR  
 CALCULATED-DESIGNED BY CHECKED BY  
 REVISED BY DATE REVISED

LAST REVISION DATE PLOTTED => #DATE  
 11-22-09 TIME PLOTTED => #TIME

# Appendix K. Results of Tree Surveys

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

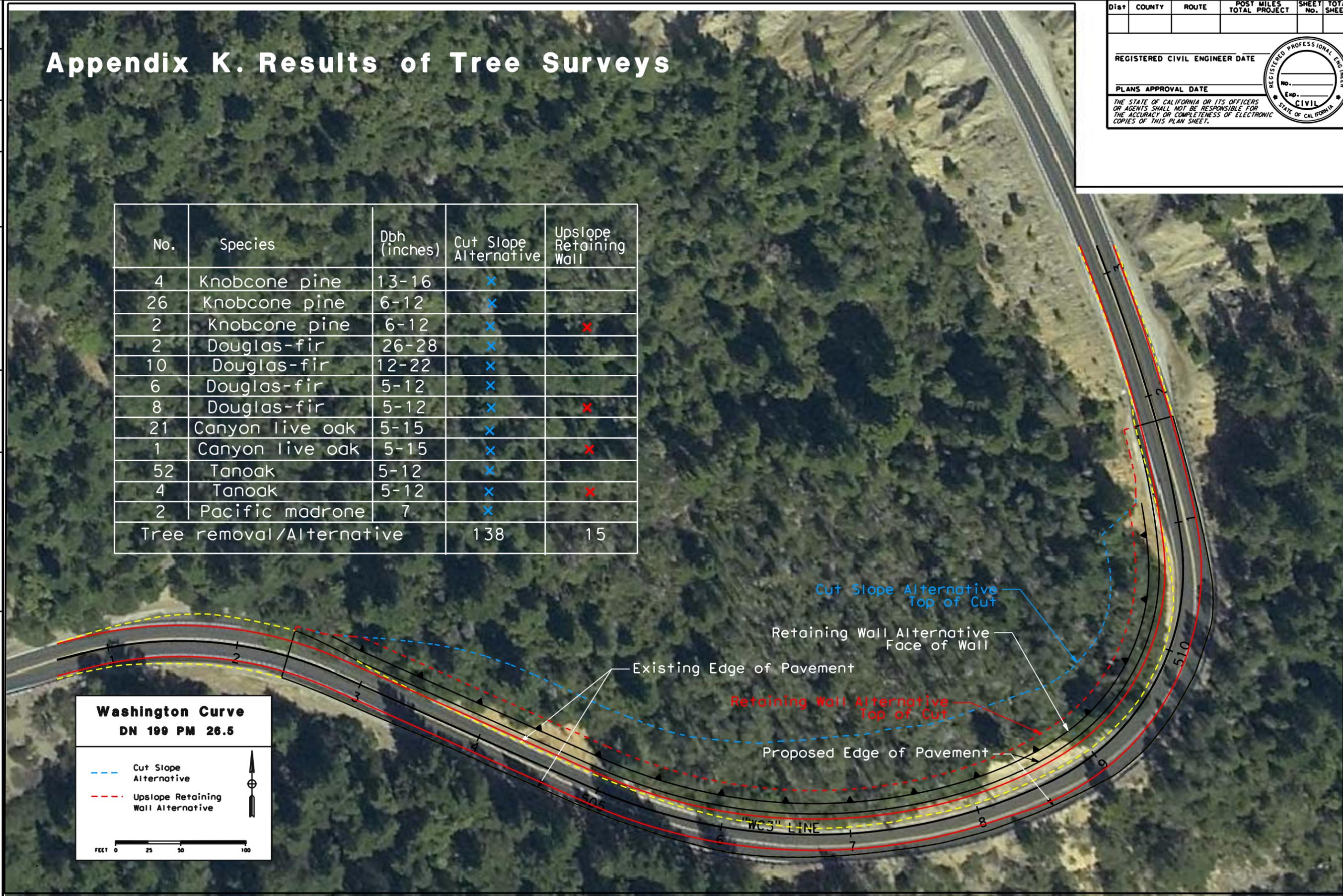
REGISTERED CIVIL ENGINEER DATE \_\_\_\_\_

PLANS APPROVAL DATE \_\_\_\_\_

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

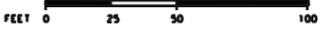


No.	Species	Dbh (inches)	Cut Slope Alternative	Upslope Retaining Wall
4	Knobcone pine	13-16	X	
26	Knobcone pine	6-12	X	
2	Knobcone pine	6-12	X	X
2	Douglas-fir	26-28	X	
10	Douglas-fir	12-22	X	
6	Douglas-fir	5-12	X	
8	Douglas-fir	5-12	X	X
21	Canyon live oak	5-15	X	
1	Canyon live oak	5-15	X	X
52	Tanoak	5-12	X	
4	Tanoak	5-12	X	X
2	Pacific madrone	7	X	
Tree removal/Alternative			138	15



**Washington Curve**  
DN 199 PM 26.5

- Cut Slope Alternative
- Upslope Retaining Wall Alternative

REVISOR: \_\_\_\_\_

DESIGNER: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_

FUNCTIONAL SUPERVISOR: \_\_\_\_\_

DEPARTMENT OF TRANSPORTATION

STATE OF CALIFORNIA - **Caltrans**

LAST REVISION: \_\_\_\_\_ DATE PLOTTED => \$DATE  
00-00-00 TIME PLOTTED => \$TIME



Appendix L Summary of Wetland/Waters Habitat  
Functions and Values at all  
Locations for the 197/199 Safe  
STAA Access Project in Del Norte  
County

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**Appendix L. Summary of Wetland/Waters Habitat Functions and Values at All Locations for the 197/199 Safe STAA Access Project in Del Norte County**

Function / Value	Criteria	Riverine Upper Perennial Isolated Freshwater Seeps <sup>1</sup>	Riverine Upper Perennial Rock Bottom <sup>2</sup>	Riverine Perennial/ Intermittant <sup>3</sup>	Palustrine Emergent <sup>4</sup>
Groundwater recharge	High: groundwater table slopes away from wetland, non-riparian, not permanently inundated. Low: wetlands with impervious underlying strata or marine/estuarine wetlands	High (3) Rationale: Groundwater table slopes away from wetland.	Low (1) Rationale: underlying strata is bedrock.	Low (1) Rationale: Groundwater table slopes toward drainage.	Low (1) Rationale: Permanently inundated
Groundwater discharge	High: permanently inundated, below dam/impoundment, outlets but no defined inlet, presence of springs Low: rated "High" for groundwater recharge, non-permanently flooded wetlands lacking the "High" characteristics defined above	Moderate (3) Rationale: Permanently inundated, outlet but no defined inlet, presence of springs	Low (1) Rationale: Not permanently inundated. Defined inlet and outlet.	Low (1) Rationale: Not permanently inundated. Defined inlet and outlet.	Moderate (2) Most areas not permanently inundated. Non-riparian No defined inlet, weakly define outlet
Floodflow alteration	High: regulated reservoir, outflow less than inflow, non-tidal, capacity to delay runoff (depression) Low: permanently inundated (i.e. less capacity), no potential for ponding, all tidal wetlands	Moderate (2) Rationale: Permanently inundated, some potential for ponding	Low (1) Rationale: No runoff delay, permanently inundated	Moderate (2) Rationale: Some areas not permanently inundated.	High (3) Rationale: Permanently inundated, potential for ponding
Sediment Stabilization	High: potential erosive forces present, canals/levees present that confine water, high water velocity, evidence of long-term erosion, presence of water & vegetation interspersions. Low: no flowing water, no open water wider than 100', no eroding areas abutting the wetland, no vegetation or rubble	High (3) Rationale: Potential erosive forces present, presence of water & vegetation interspersions	High (3) Rationale: High water velocity, evidence of long-term erosion	High (3) Rationale: Erosion present, ditches confine water, high water velocity, vegetation interspersions	Moderate (2) Rationale: In median-- Well vegetated, no flowing water, no open water wider than 100'
Sediment/toxicant retention	High: potential for erosion or toxicants in the watershed combined with capacity to confine or impound water; no outlet (or constricted), riffle and pool complexes, erect vegetation Low: no flowing water, no open water, >100 feet wide, or no vegetation; immediately downstream of impoundment, high-velocity flows, tidal flows	Low (1) Rationale: Flowing water, <100 feet wide.	Low (1); Rational: High-velocity flow, no vegetation.	Moderate (2) Rationale: Flowing water, vegetation present.	High (3) Rationale: Water confined, vegetation present.
Nutrient removal/transformation	High: same as for sediment/toxicant retention (capacity to confine or impound water; no outlet, constricted, riffle & pool complexes, erect vegetation) Low: low sediment trapping, peat sediments, anoxic water column, marine wetlands	Low (1) Rationale: Flowing water, <100 feet wide.	Low (1) Rationale: High-velocity flow	Moderate (2) Rationale: Flowing water, vegetation present.	High (3) Rationale: Water confined, vegetation present.
Production export	High: high primary productivity & high water velocity; Riverine wetlands with eutrophic conditions. Marine or estuarine with high primary productivity or eutrophic conditions. Low: no permanent or intermittent outlets	Moderate (2) Rationale: low water velocity.	High (3) Rationale: High primary productivity & high water velocity	Moderate (2) Rationale: low water velocity, permanent outlet.	Low (1) Rationale: No permanent or intermittent outlets
Wildlife diversity/abundance	High: riparian wetlands, floodplain wetlands, high vegetation diversity, wetland-upland complexes, large & diverse wetlands Low: isolated wetlands within urbanized areas, lack of connecting corridors, small wetlands with low vegetation diversity or narrow ecotones	Moderate (2) Rationale: moderate wildlife and plant diversity. Habitat for plants and amphibians	High (3) Federally listed SONCC Coho in MF Smith River. Other aquatic species present.	Low (1) Rationale: Roadside drainages, lack connecting corridors, low vegetation diversity, narrow ecotones	Low (1) Rationale: Roadside drainages, lack connecting corridors, low vegetation diversity, narrow ecotones
Aquatic diversity/abundance	High: regularly flooded, erect vegetation, adequate levels of dissolved oxygen, diverse vegetation cover providing partial shading Low: substrate of bedrock or rubble, farmed, acidic surface water	Moderate (2) Rationale: High dissolved oxygen, diverse vegetation cover, bedrock substrate	High (3) Rationale: diverse fish and other aquatic species present. Habitat, nursery, & refuge areas for fish.	Low (1) Rationale: Roadside drainages, lack of connecting corridors, low vegetation diversity,	Low (1) Rationale: Roadside drainages, lack connecting corridors, low vegetation diversity,
Uniqueness/heritage	High: presence of special status species, significant archeological resources, "unique" wetland types, or publicly owned lands designated for conservation, preservation, or research Low: absence of criteria listed above	High (3) Rationale: provide habitat for rare plants	High (3) Rationale: adjacent to the Publicly owned Wildlife Areas. Rare plants present	Low (1) Rational: in median, not a unique wetland type, not designated for conservation.	Low (1) Rational: in median, not a unique wetland type, not designated for conservation.
Recreation	High: wetlands utilized and accessible for recreation Low: wetlands not utilized or accessible for recreation	Low (1) Rationale: wetlands not utilized or accessible for recreation	High (3) Rationale: MF Smith River used for swimming, fishing, boating	Low (1) Rationale: Drainages not utilized or accessible for recreation	Low (1) Rationale: Roadside wetlands not utilized or accessible for recreation.
<b>Overall Wetland Function/Values*:</b>		<b>23 (Moderate)</b>	<b>23 (Moderate)</b>	<b>17 (Low)</b>	<b>19 (Moderate)</b>

\* Overall Function/Values; 11-17, Low; 18-25, Moderate; 26-33, High.

<sup>1</sup> Present at PCN Locations 1 & 2, The Narrows; <sup>2</sup> Present at PCN Location 2

<sup>3</sup> Perennial/intermittent drainages present at all locations,

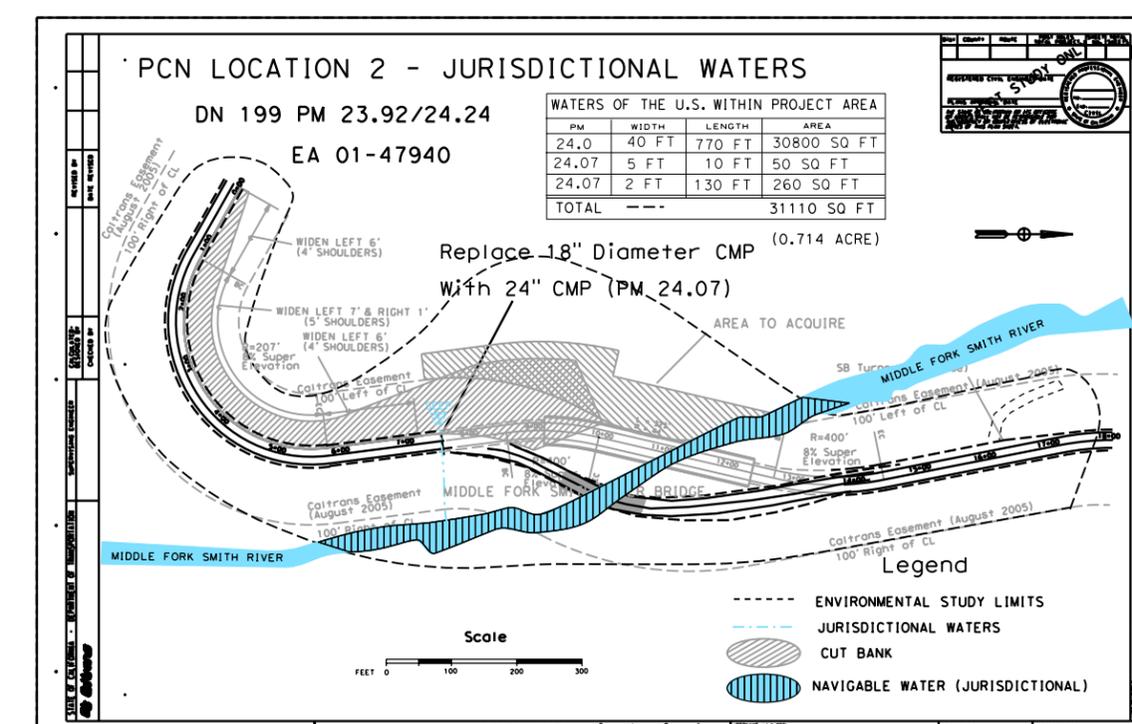
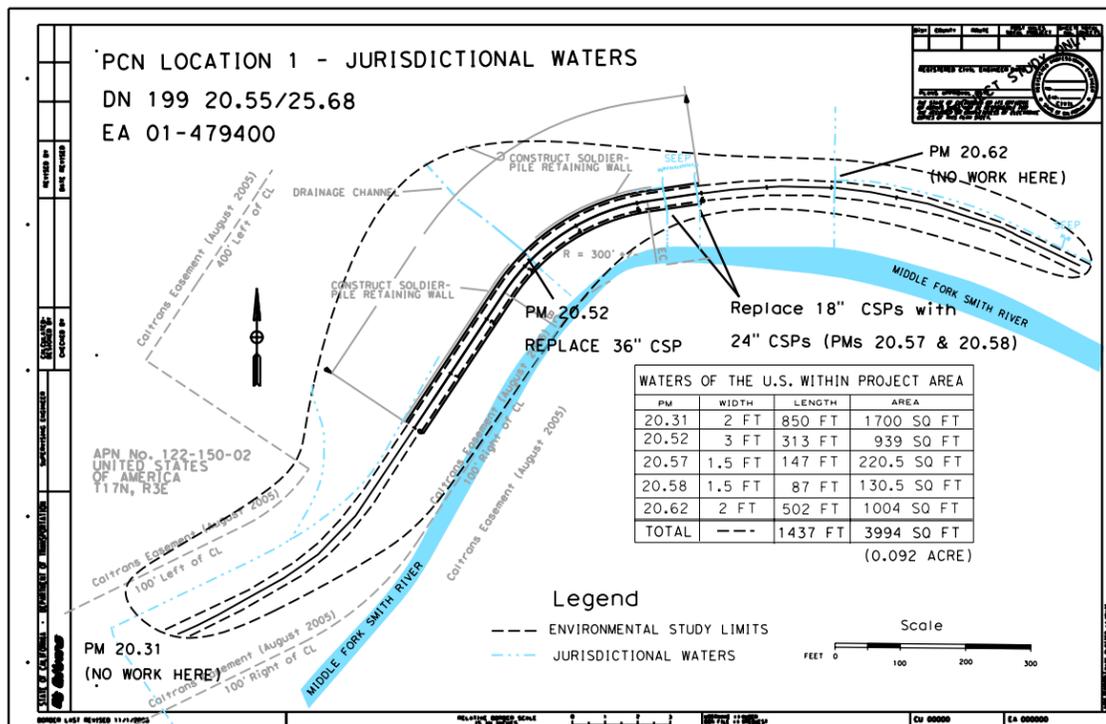
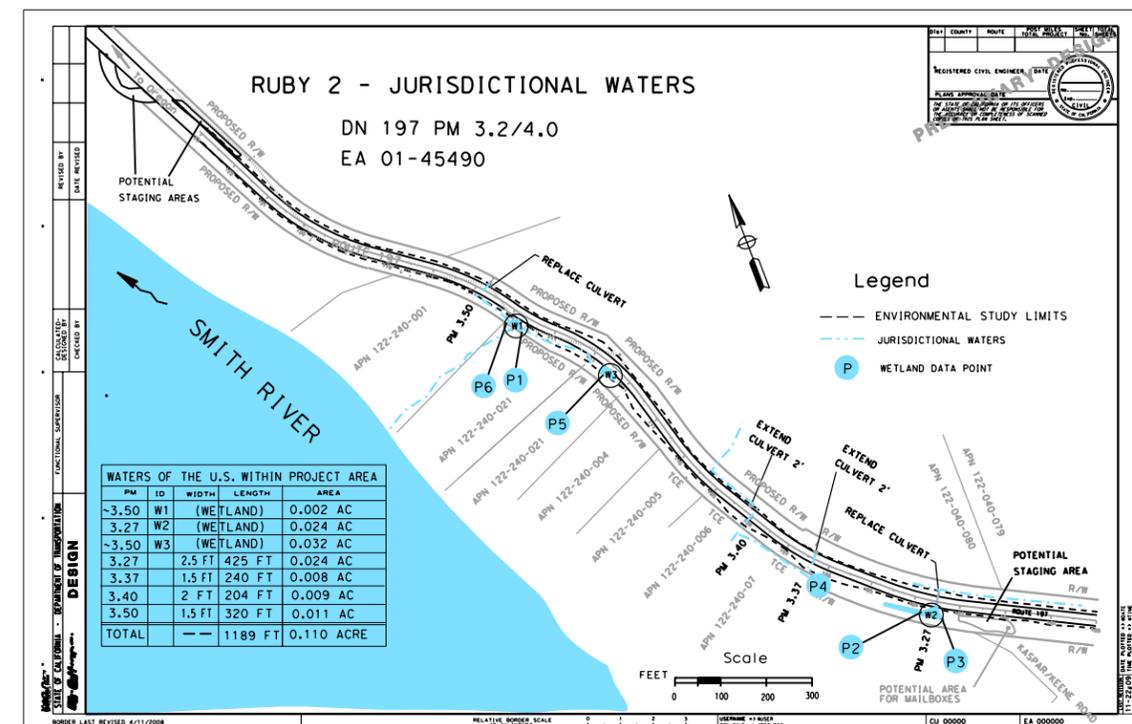
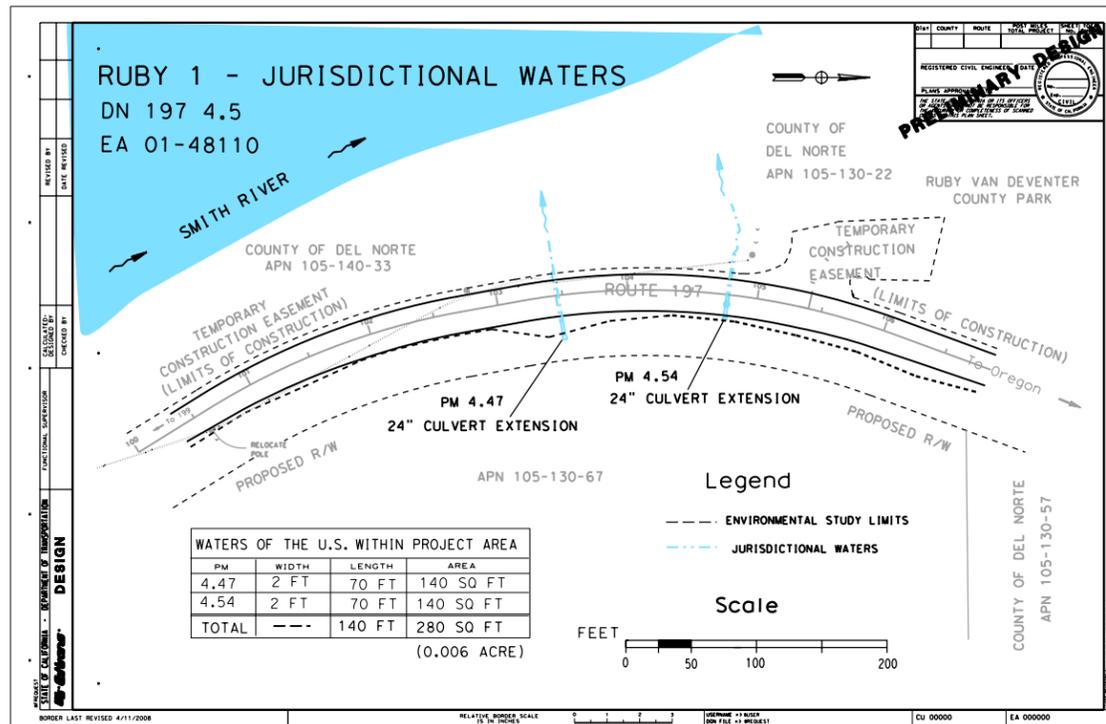
<sup>4</sup> Present at Ruby 2 and The Narrows

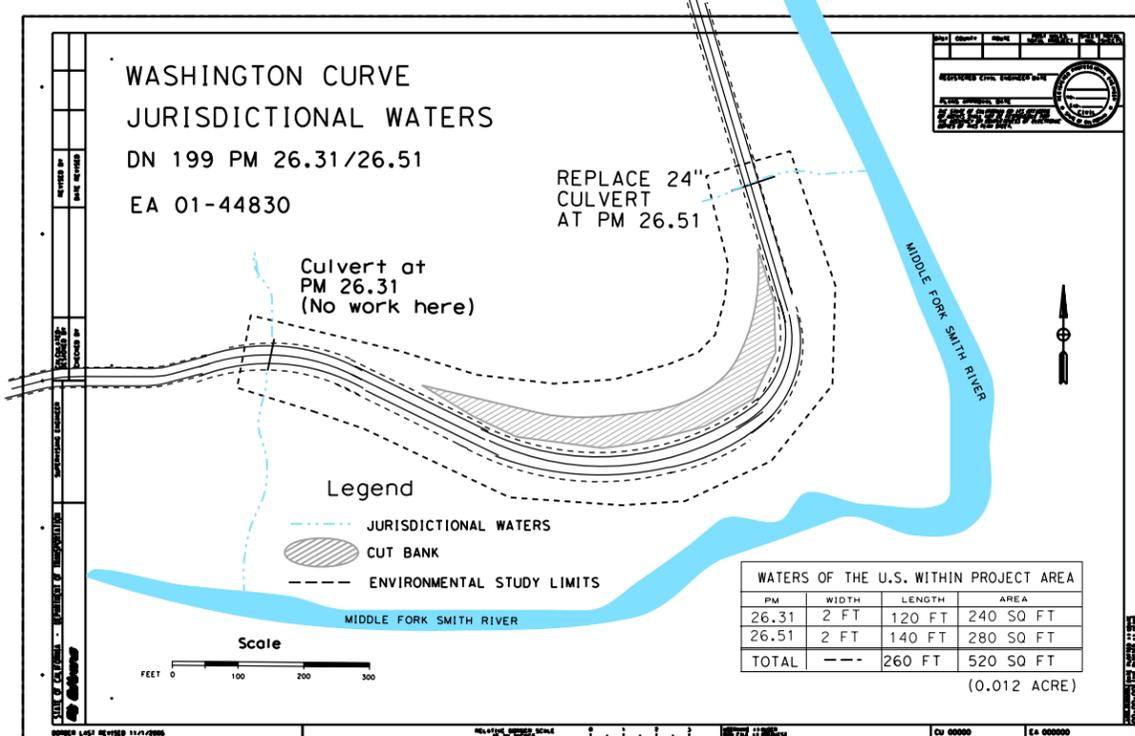
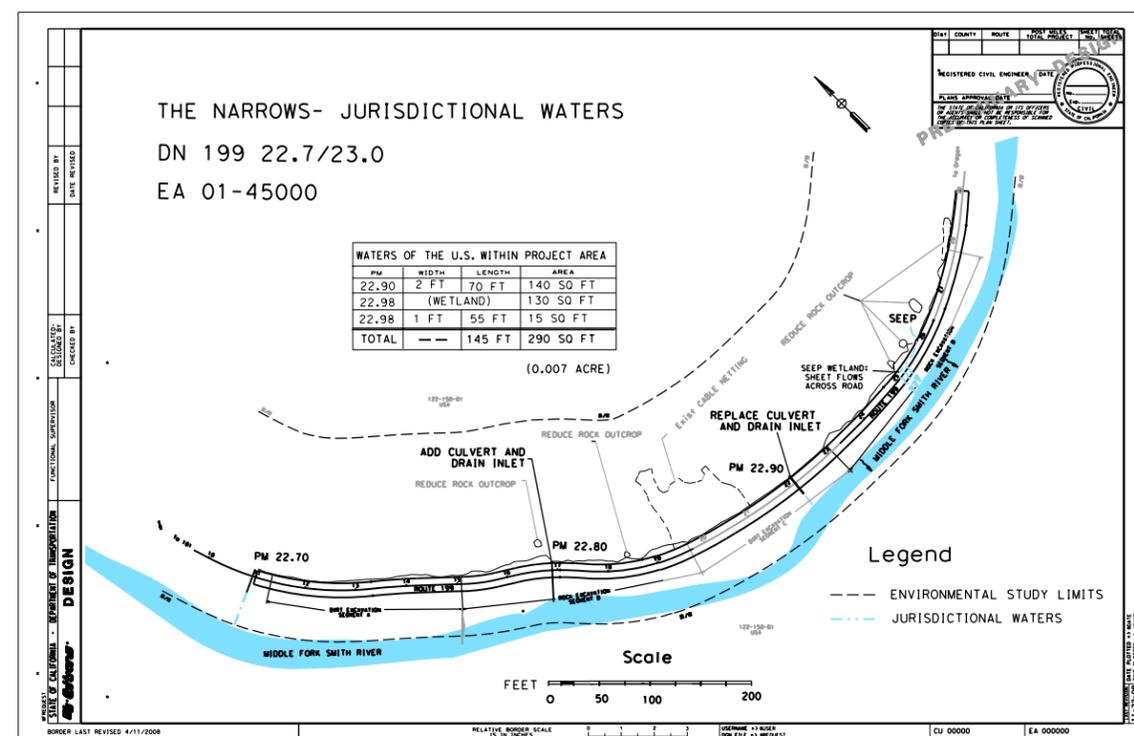
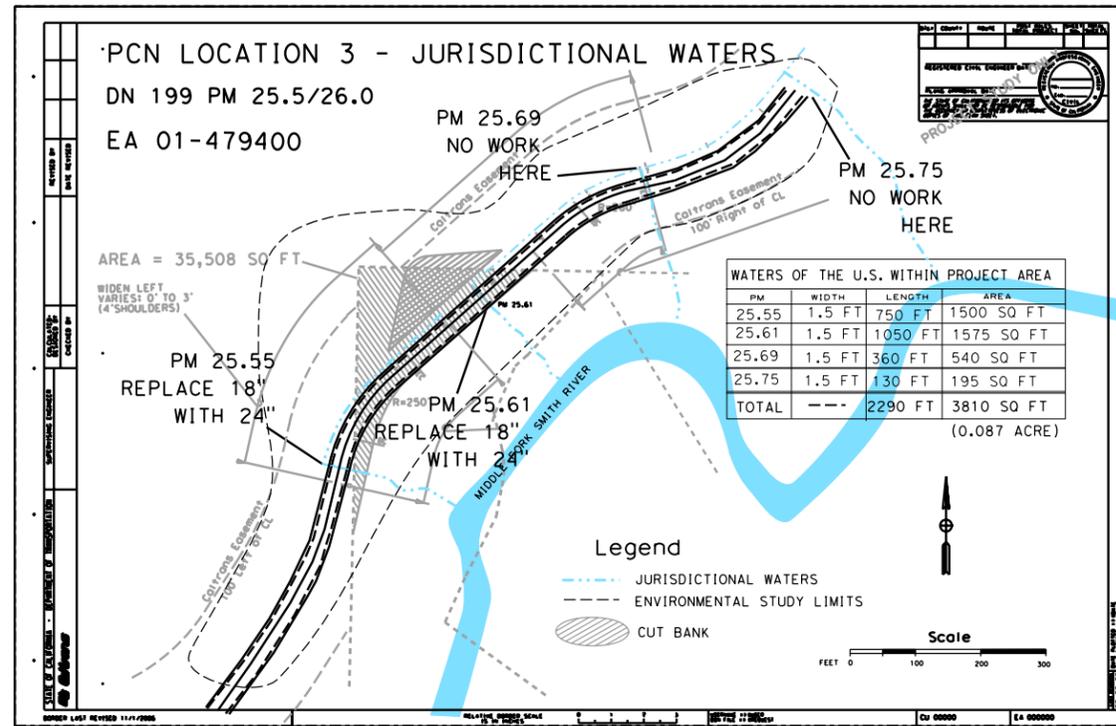


Appendix M Wetlands and Other Waters at the  
DN 197/199, STAA Locations

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Appendix N Plants Observed in the Study Area  
and Results of CNDDDB and CNPS  
Inventory Records Search

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**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				
<b>Trees</b>										
<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
<b>Shrubs</b>										
<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			

**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				
<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
<b><i>Salix delnortensis</i></b>	<b>Del Norte willow</b>	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
<b>Herbaceous Plants: Ferns &amp; Relatives</b>									
<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				

**Appendix N. Plant Species Observed in the Study Area.**

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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>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
<i>Selaginella wallacei</i>	Wallace's spikemoss	Selaginellaceae		X	X		X			
<i>Woodwardia fimbriata</i>	giant chainfern	Blechnaceae		X	X	X	X			
<b>Herbaceous Plants: Dicots</b>										
<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		

**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>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
<b><i>Cardamine nuttallii</i> var. <i>gemmata</i></b>	<b>yellow-tubered toothwort</b>	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 centaureum	Gentianaceae			X					
<i>Centaureum muehlenbergii</i>	Monterey centaury	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					
<b><i>Cypripedium californicum</i></b>	<b>California lady's slipper</b>	Orchidaceae		X			X			
<b><i>Darlingtonia californica</i></b>	<b>California pitcherplant</b>	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	

**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>Epipactis gigantea</i>	stream orchid	Orchidaceae		x						
<i>Erechtites minima</i> *	fireweed	Asteraceae							x	
<b><i>Erigeron cervinus</i></b>	<b>Siskiyou daisy</b>	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	
<b><i>Lathyrus delnorticus</i></b>	<b>Del Norte pea</b>	Fabaceae				x				
<i>Lathyrus latifolius</i> *	perennial sweet pea	Fabaceae		x						
<i>Lathyrus polyphyllus</i>	leafy pea	Fabaceae					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>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				
<b><i>Lomatium howellii</i></b>	<b>Howell's lomatium</b>	Apiaceae		x						
<i>Lomatium macrocarpum</i>	large fruited lomatium	Apiaceae	x							
<b><i>Lomatium martindalei</i></b>	<b>Coast Range lomatium</b>	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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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>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					
<b><i>Pinguicula macroceras</i></b>	<b>horned butterwort</b>	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					
<b><i>Saxifraga howellii</i></b>	<b>Howell's saxifrage</b>	Saxifragaceae		x						

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			All	Loc. 1	Loc. 2	Loc. 3				
<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.	stonecrop	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			
<b><i>Thermopsis gracilis</i> var. <i>gracilis</i></b>	<b>slender false lupine</b>	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	
<i>Trifolium repens</i> *	white clover	Fabaceae		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	
<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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			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		
<b>Herbaceous Plants: Monocots</b>										
<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> *	hedghegog 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			
<b><i>Poa piperi</i></b>	<b>Piper's bluegrass</b>	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						
<b>Number of taxa at site</b>				<b>136</b>	<b>221</b>	<b>106</b>	<b>165</b>	<b>128</b>	<b>83</b>	<b>112</b>
<b>% of non-native taxa</b>				<b>32</b>	<b>23</b>	<b>49</b>	<b>30</b>	<b>19</b>	<b>37</b>	<b>40</b>
<b>Total Number of Plant Taxa = 452</b>	<b>Non-native = 23%</b>									

## 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 range<sup>1</sup>.

- 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 rank<sup>1</sup>:

- 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.

<sup>1</sup> 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](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.

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 Selected Elements by Scientific Name - Portrait  
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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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Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
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

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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	

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 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

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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	PDASTDT0F4			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 &amp; 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

**Status:** Plant Press Manager window with 39 items - Fri, Jul. 31, 2009 14:40 c

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

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

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

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

## CNPS Inventory of Rare and Endangered Plants

**Status:** Plant Press Manager window with 61 items - Fri, Jul. 31, 2009 14:36 c



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

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

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

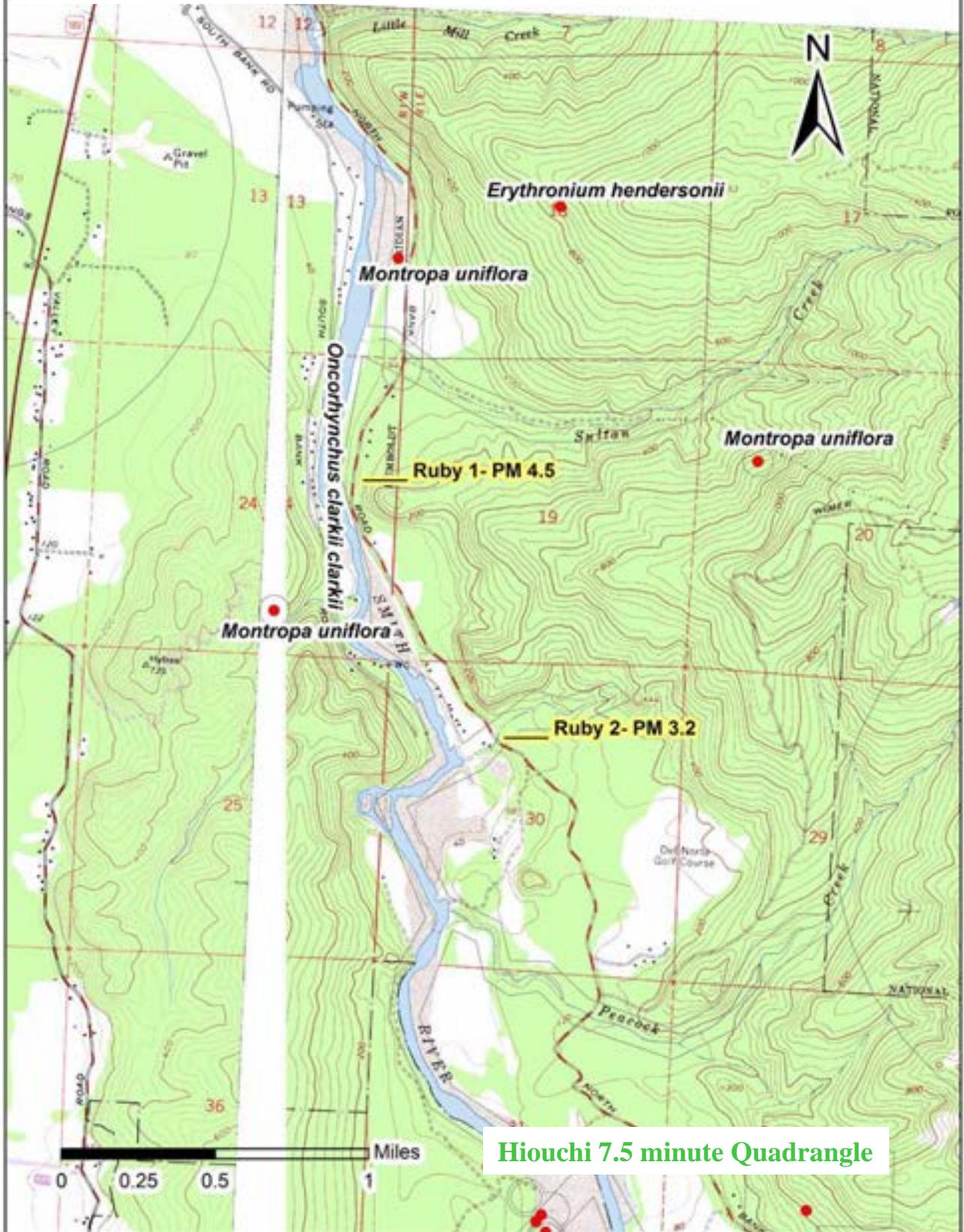
	<b><u>Viola langsdorfii</u></b>	Langsdorf's violet	Violaceae	List 2.1
	<b><u>Viola palustris</u></b> 	alpine marsh violet	Violaceae	List 2.2
	<b><u>Viola primulifolia</u> ssp. <u>occidentalis</u></b> 	western white bog violet	Violaceae	List 1B.2

## Appendix O CNDBB Quad Maps

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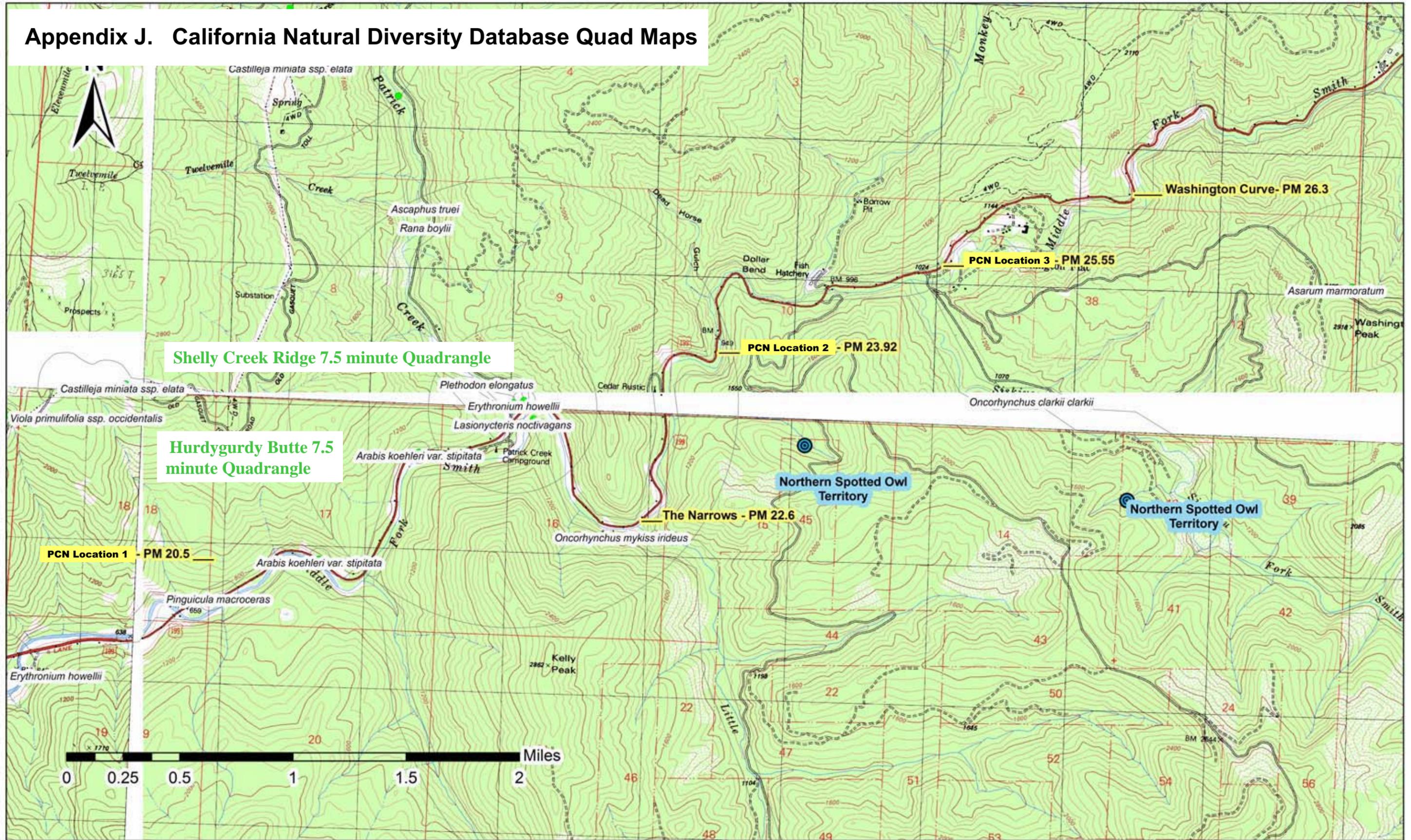


# Appendix J. California Natural Diversity Database Quad Maps



Hiouchi 7.5 minute Quadrangle

# Appendix J. California Natural Diversity Database Quad Maps



Appendix P Special-Status Species List and  
Section 7 Consultation Opinions

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# Listed/Proposed Threatened and Endangered Species for Del Norte County (Candidates Included)

March 18, 2013

Document number: 881376945-123456

**KEY:**

(PE) Proposed Endangered Proposed in the Federal Register as being in danger of extinction  
 (PT) Proposed Threatened Proposed as likely to become endangered within the foreseeable future  
 (E) Endangered Listed in the Federal Register as being in danger of extinction  
 (T) Threatened Listed as likely to become endangered within the foreseeable future  
 (C) Candidate Candidate which may become a proposed species Habitat Y = Designated, P = Proposed, N = None Designated  
 \* Denotes a species Listed by the National Marine Fisheries Service

Type	Scientific Name	Common Name	Category	Critical Habitat
<b>Plants</b>				
	<i>Arabis macdonaldiana</i>	McDonald's rock-cress	E	N
	<i>Lilium occidentale</i>	western lily	E	N
<b>Invertebrates</b>				
*	<i>Haliotis cracherodii</i>	black abalone	E	N
	<i>Polites mardon</i>	mardon skipper	C	N
	<i>Speyeria zerene hippolyta</i>	Oregon silverspot butterfly	T	Y
<b>Fish</b>				
*	<i>Acipenser medirostris</i>	green sturgeon	T	Y
	<i>Eucyclogobius newberryi</i>	tidewater goby	E	Y
*	<i>Oncorhynchus kisutch</i>	S. OR/N. CA coho salmon	T	Y
*	<i>Oncorhynchus tshawytscha</i>	CA coastal chinook salmon	T	Y
*	<i>Thaleichthys pacificus</i>	Southern eulachon DPS	T	P
<b>Reptiles</b>				
*	<i>Caretta caretta</i>	loggerhead turtle	T	N
*	<i>Chelonia mydas (incl. agassizi)</i>	green turtle	T	N
*	<i>Dermochelys coriacea</i>	leatherback turtle	E	Y
*	<i>Lepidochelys olivacea</i>	olive (=Pacific) ridley sea turtle	T	N
<b>Birds</b>				
	<i>Brachyramphus marmoratus</i>	marbled murrelet	T	Y
	<i>Charadrius alexandrinus nivosus</i>	western snowy plover	T	Y
	<i>Coccyzus americanus</i>	Western yellow-billed cuckoo	C	N
	<i>Phoebastris albatrus</i>	short-tailed albatross	E	N
	<i>Strix occidentalis caurina</i>	northern spotted owl	T	Y
<b>Mammals</b>				
*	<i>Balaenoptera borealis</i>	sei whale	E	N
*	<i>Balaenoptera musculus</i>	blue whale	E	N
*	<i>Balaenoptera physalus</i>	fin whale	E	N
*	<i>Eumetopias jubatus</i>	Steller (=northern) sea-lion	T	Y

	<i>Martes pennanti</i>	fisher, West Coast DPS	C	N
*	<i>Megaptera novaengliae</i>	humpback whale	E	N
*	<i>Orcinus orca</i>	killer whale, S. resident	E	Y
*	<i>Physeter macrocephalus</i>	sperm whale	E	N



**UNITED STATES DEPARTMENT OF COMMERCE**

**National Oceanic and Atmospheric Administration**

NATIONAL MARINE FISHERIES SERVICE

Southwest Region

501 West Ocean Boulevard, Suite 4200

Long Beach, California 90802-4213

MAY 07 2012

In response refer to:  
2012/00583

Mr. Gary Berrigan  
Senior Environmental Planner  
California Department of Transportation, District 1  
P.O. Box 3700  
Eureka, California 95502-3700

Dear Mr. Berrigan:

On March 29, 2012, NOAA's National Marine Fisheries Service (NMFS), received both your request for reinitiation of informal consultation and an updated biological assessment (BA) regarding the California Department of Transportation's (Caltrans') proposed 197/199 SAFE STAA (Federal Surface Transportation Assistance Act of 1982) Access Project (project), pursuant to section 7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. § 1531 et seq.) and its implementing regulations (50 CFR Part 402). The project is located in Del Norte County, California.

On February 13, 2012, NMFS received the initial consultation request and BA for the project, and completed section 7 consultation with the issuance of a letter of concurrence (LOC) dated March 15, 2012. Caltrans subsequently modified the project BA (to clarify the proposed action) and requested reinitiation of consultation. This LOC replaces the March 15, 2012, letter of concurrence.

Caltrans is the designated non-federal representative for the Federal Highway Administration (FHWA), which is funding the project. Effective July 1, 2007, FHWA assigned, and Caltrans assumed, the authority to approve most highway projects in California (such as this project) and the responsibility to conduct any environmental consultations required as a condition of such approval. Pursuant to FHWA's designation of Caltrans as a non-federal representative for the purposes of ESA section 7 consultations with NMFS, Caltrans is serving as the Federal action agency for this project.

Caltrans also requested consultation on essential fish habitat (EFH) for species managed under the Pacific Coast Salmon Fishery Management Plan, pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), 16 U.S.C. § 1855(b).

This letter constitutes completion of informal consultation for the following listed species and their designated critical habitat:



Southern Oregon/Northern California Coast coho salmon Evolutionarily Significant Unit (ESU)  
*Oncorhynchus kisutch*  
 Threatened (70 FR 37160, June 28, 2005)  
 Critical habitat (64 FR 24049, May 5, 1999)

This letter also serves as consultation under the authority of and in accordance with the provisions of the Fish and Wildlife Coordination Act (FWCA) of 1934, as amended.

## DESCRIPTION OF THE PROPOSED ACTION

To accommodate larger vehicles and trucks, Caltrans proposes to widen the roadway and perform additional safety related improvements at seven locations on state routes 197 and 199 along the Smith River in Del Norte County, California. The project involves blasting, cut-slope excavation and disposal, retaining wall construction, culvert work, bridge replacement, use of disposal/borrow sites, equipment staging areas, utility relocation, permanent right-of-way acquisition, temporary construction easements, and vegetation removal. Staging of equipment and supplies will take place in existing disturbed areas, road shoulders, on the road prism, or in pullouts.

Table 1. Project information by site.

Project Element	Site						
	Ruby 1	Ruby 2	The Narrows	Patrick Creek Narrows Loc. 1 (PCN-1)	Patrick Creek Narrows Loc. 2 (PCN-2)	Patrick Creek Narrows Loc. 3 (PCN-3)	Washington Curve
Disturbed Soil (acres)	0.3	0.73	0.2-0.4	0.25	3.0	0.3	1.4
Increase in Impervious Surface (acres)	0.1	0.1	0.1-0.2	0.06	0.25	0.09	0.16
No. of trees to be removed	6	16	0	0	84	0	120
Temporary impacts of Waters/Wetlands (acres)	0.004	0.009	0.002	0.003	0.002	0.004	0.003
Distance from River channel (feet)	50	200-450	30	50	0	140	115
Excavation (cubic yards)	200	600	5500	50	20,000	90	20,000
Fill (cubic yards)	50	600	0	100	150	130	0
Blasting	No	No	Yes	No	Yes	No	No

### Ruby 1 Site

At the Ruby 1 site (State Route (SR)-197- Post Mile (PM) 4.5) Caltrans proposes to widen the roadway, improve the existing roadbed elevation (*i.e.*, the super elevation), and replace or extend associated culverts. The super elevation is defined as the "horizontal curve that a road has that is tilted at a slight angle." The curve radii will be improved to allow for a longer line of sight distance and the width of the road shoulders will be increased from their existing 0 to 1 foot width to up to 4 feet for approximately 1,070 feet of roadway. One existing culvert will be replaced, and one culvert will be extended 10 feet on the inlet side with a flared inlet section. The culvert outlets are 150 and 220 feet from the river, respectively, and both are seasonal drainages. New drainage inlet systems will be installed, and the old inlets will be removed. Culvert work will be done during the dry season (June 15 to October 15) and no water diversion or dewatering is anticipated to be needed. See table 1 for more information.

### Ruby 2 Site

At the Ruby 2 site (SR 197- PM 3.2/4.0) the roadway will be widened in spot locations, the super elevation will be improved, and four culverts will be replaced. Shoulder widths will be increased to 2 feet in spot locations. Cut slope ratios of up to 1:1 and fill slope ratios of 2:1 or less will be contoured, and hot mix asphalt will be applied to improve the existing super elevation. See table 1 for more information.

Four culverts will be replaced or extended (table 2). All the culverts are on seasonal drainages. Culvert work will be done during the dry season, however, a clear water diversion or dewatering may be required if water is present during the time of construction. A clear water diversion consists of a system of structures and measures that intercept clear surface water runoff upstream of a project site, transport it around the work area, and discharge it downstream with minimal water quality degradation for either the project construction operations or the construction of the diversion. Clear water diversions are used in a waterway to enclose a construction area and reduce sediment pollution from construction work occurring in or adjacent to water.

Table 2. Proposed culvert work at Ruby 2 site.

Culvert Location	Culvert outlet location	Existing culvert size	Proposed change
SR 197 PM 3.27	600 feet upslope of mainstem Smith River	30" Corrugated Steel Pipe (CSP)	Replace with 30" CSP
SR 197 PM 3.37	480 feet upslope of mainstem Smith River	18" CSP	Extend and replace 2 feet of inlet
SR 197 PM 3.40	430 feet upslope of mainstem Smith River	24" reinforced concrete pipe	New inlet installation
SR 197 PM 3.50	350 feet upslope of mainstem Smith River	24" CSP	Replace with 24" CSP

### **The Narrows Site**

Proposed work at the Narrows site (U.S. Highway 199- PM 22.7/23.0) will increase lane widths to 12 feet and provide 2-foot-wide shoulders. Work will include controlled blasting and excavation with heavy equipment into the existing roadside cut slope and will occur more than 60 feet from the MF of the Smith River. Controlled blasting will involve placing charges in pre-drilled holes in the rock, and releasing the charges to fracture and crumble the surrounding rock. A blasting mat will be used to control debris fall, and a one foot thick pad of loose dirt will be placed on the pavement below the holes to cushion the pavement against rockfall damage and reduce the tendency of rocks to bounce and roll. K-rail barriers will also be deployed at the locations of active drilling or blasting operations. In slope locations of soft material, mechanical equipment will be used to remove material.

A one-foot wide, paved drainage ditch will be added to the inboard shoulder of the road for 29 feet. One new 24-inch diameter, 50-foot-long culvert will be installed and an existing 24-inch diameter by 50-foot long culvert will be replaced with a 24-inch diameter by 55-foot-long pipe to match the new end of pavement. These culverts drain seasonal drainages that are not fish bearing. Work will be done in the dry season and a gravel bag check dam will be used if necessary to dewater the work site.

### **The Patrick Creek Narrows-1 Site**

The existing roadway at Patrick Creek Narrows-1 (PCN-1; US 199- PM 20.5/20.9) will be widened to accommodate two 12-foot wide lanes and 4-foot wide shoulders. A 230-foot long, 5-foot tall retaining wall will be built along the river side of the road to accommodate the wider and broader roadway curve, and to prevent perennial rock fall from the unconsolidated material that exists on the uphill side of the roadway. The retaining wall will be approximately 50 feet above the Ordinary High Water Line (OHWL) of the MF Smith River. The construction of the retaining wall will require installation of 35, 16-inch diameter cast in drilled hole (CIDH) piles, excavation, drilling holes for the piles, pouring the concrete into forms and the installation of modified type 80 rail. Additional work includes reconstruction of the existing drainage ditch adjacent to the base of the cut slope, grinding of existing asphalt-concrete to match the new super elevation, and application of an open graded asphalt concrete overlay. See table 1 for additional project information.

An existing 36-inch diameter culvert will be replaced in kind to match the new roadway width, and two existing 18-inch diameter culverts will be replaced with 24-inch diameter culverts. All of the culvert inlets will be replaced. The culverts outlet onto the steep, vegetated bank of the MF Smith River approximately 50 feet from the live channel. If necessary, rock slope protection (RSP) will be placed at the culvert outlets to minimize erosion. Work will be done during the dry season, however, if needed, a clear water diversion will be used during construction.

### **The Patrick Creek Narrows-2 Site**

Work at the Patrick Creek Narrows-2 site (PCN-2; US 199-23.9/ PM 23.92-24.08) will involve roadway widening, construction of two retaining walls, replacement of an existing bridge over

the MF Smith River, demolition of the existing bridge, and excavation of the road side hillslope. To widen the roadway on the most westerly extent, approximately 20,000 CY of excavation from the rock cut slope will be required. Rock excavation will extend to 150 feet above the highway and expose approximately 1.0 acre of newly excavated rock slope. Controlled blasting will be performed where necessary. BMPs as described above will be implemented to prevent debris from entering the river.

The existing arch bridge will be replaced with a wider, 345-foot-long arch bridge downstream from the current location and the old bridge will be dismantled. A biostrip will be constructed on the northwest side of the new bridge and will aid in stormwater drainage. A 145-foot-long by 22-foot-high retaining wall will be built on the southeast side of the new bridge, and will be located between 15 and 40 feet above the OHWL. Supports for the retaining wall will consist of steel soldier piles that will be placed in drilled holes. Access for the drill rig would be from land, or a drill platform will be constructed on the river bank southeast of the bridge above the OHWL within the existing roadway, or within the area of the new roadway alignment. A 100-foot-long retaining wall will be constructed on the northeast side of the bridge and will be between 90 and 200 feet from the OHWL.

Blasting for construction of falsework and footings may occur, and would be performed between 5 and 30 feet from of the MF Smith River summer flow level (920 feet elevation). Where possible, rock and material will be removed from the site using heavy equipment. Falsework platforms for bridge construction will be placed from 5 to 10 feet of the wetted channel and will be removed immediately following completion of the construction season. CIDH piles will be the foundation type for all of the new bridge piers and abutments and will be installed approximately 10 feet above the summer flow water line. The abutments will be approximately 25 feet above the OHWL. The viaduct portion of the new bridge will be approximately 10 to 50 feet above the OHWL. All of the abutments, piers, and footings will be outside of the OHWL and no in-channel work is proposed. No impact pile driving is proposed.

After the new bridge is completed, the existing bridge will be demolished. A demolition containment platform will be constructed across the river to prevent debris from entering the MF Smith River. The platform will be constructed under the existing bridge and extend up to 50 feet upstream. Debris will fall onto the containment system and be retrieved regularly. The existing spread footings of the old bridge will be cut off flush to the ground surface when they are on bedrock or within OHWL, or cut 3 feet below the finish grade and backfilled with native soil when they are in soil and above OHWL.

An existing 18-inch diameter CSP culvert will be replaced with a 24-inch diameter culvert and a new drainage inlet will be installed. This culvert drains a steep, seasonal channel that is not fish bearing. Work will be done during the dry season; however, a clear water diversion will be used if necessary.

### **The Patrick Creek Narrows-3 Site**

The road shoulder at Patrick Creek Narrows-3 (PCN-3; US 199- PM 25.5/25.6) will be extended to 4 feet on both sides of the road, and the "S" curve will be straightened. To support the wider

roadway, an approximately 195-foot-long by 15-foot-tall soldier pile retaining wall will be built on the river side of the road. Excavation for the retaining wall will be approximately 100 feet from the OHWL, and will be performed from the roadway level. A drilled pile foundation will be required. See table 1 for project activities and impacts.

One 18-inch diameter culvert and downdrain will be replaced with a 24-inch diameter culvert and downdrain to match the new roadway width and one drainage inlet will be replaced at another culvert. An area of 8-ft by 12-ft of Rock Slope Protection (RSP) will be placed at the outlet of the new culvert. These culverts outlet between 10 and 100 feet from the channel of the MF Smith River, and are both high gradient, seasonal channels that are not fish bearing. The work will be done in the dry season, however; a clear water diversion will be utilized if necessary.

### **The Washington Curve Site**

Improvements at the Washington Curve site (US 199- PM 26.3/26.5) consist of widening the pavement and roadside drainage ditches and slightly increasing the radius of the tightest curve. The existing travel lane width varies from 10 to 12 feet and shoulders vary from 0 to 4 feet. The project will increase lane width to 12 feet and increase shoulders to between 4 and 6 feet. A new slope on the cut slope side of the highway will be excavated to make room for the widened pavement. One 24-inch diameter culvert and its drainage inlet will be replaced in kind. Work will be done in the dry season; however, a clear water diversion will be used if necessary.

## **EFFECTS OF THE ACTION**

SONCC coho salmon inhabit the MF Smith River (Caltrans 2012). The activities described above have the potential to cause adverse effects at some sites, to SONCC coho salmon and to critical habitat indicators, including: suspended sediment, stream temperature, chemical contamination, streambank condition, and noise pollution. These effects could in turn result in increased turbidity, decreased foraging ability, sedimentation of redds and spawning gravels, increases in disease transmission, injuries to internal organs, barotrauma or mortality. Exposure of listed species to these effects at the Ruby 1, Ruby 2, The Narrows, and Washington Curve sites are anticipated to be discountable. At these sites, all the work will be done on the road surface and it is not anticipated that construction activities will have an effect on critical habitat or individuals in the areas of the MF Smith River that are adjacent to these sites. No work is planned at these sites on the streambank or in the wetted channel, and therefore effects to SONCC coho salmon and critical habitat at these sites is anticipated to be discountable. To ensure that effects remain discountable erosion control BMP, including silt fences, straw bales, and fiber rolls will be installed to prevent suspended sediment from entering the wetted channel. Since there will be no riparian vegetation removal, blasting or pile driving at these sites, there will be no exposure to effects to individuals from these activities. Overall, exposure to effects from road improvement activities at these sites is extremely unlikely to occur, and are therefore the possibility for effects to individuals and critical habitat is discountable.

SONCC coho salmon may be exposed to effects from project activities at PCN-1, PCN-2, and PCN-3 sites. Potential effects from project activities are described above. The Project does not

involve in-water construction, no permanent structures are to be placed within the river channel, and there will be no loss or alteration of instream habitat. No fish handling or dewatering is proposed, eliminating the risk of injury and mortality to individuals from these activities.

### **Water Quality**

All of the permanent bridge supporting structures will be placed at least 40 feet above the OHWL. Caltrans anticipated that the proposed action may result in increased mobilization of sediment to occur. Individuals exposed to increases in sediment can experience decreased feeding efficiency, decreased visibility, and gill damage, and habitat may be affected through decreases in pool depth and sedimentation of redds and spawning habitat. The amount of sediment that may enter the MF Smith River will be minimized to an insignificant amount due to the use of BMPs along the riverbank at all locations. Necessary erosion control BMPs will be used between the construction areas and the wetted edge of the channel, and consist of silt fences, fiber rolls, straw wattles, or catchment basins that will prevent mobilized sediment from entering the MF Smith River. Erosion control BMPs will be maintained daily to ensure proper functioning. Any sediment that enters the stream channel will be small in quantity and will be flushed downstream immediately, where it will be quickly diluted. If sediment enters the MF Smith River, turbidity will only last as long as construction is occurring and sediment is being mobilized, and turbidity levels will return to normal within hours of construction activities being completed each day.

The culverts that will be repaired or replaced have an indirect hydrologic connection to the MF Smith River, and therefore no significant changes to water quality from culvert replacement and repair activities are anticipated. All the culverts outlet onto steep, vegetated banks above the OHWL, are at least 10 feet from the wetted channel, and will be worked on in the dry season the sites are expected to be dry. If water is present at the time of construction, a clear water diversion will be used to dewater the site, and any turbid water will be pumped to a settling basin for filtration before being allowed to enter the MF Smith River. The use of a settling basin and a clear water diversion makes the effects from culvert replacement and repair activities discountable, since any water released to the MF Smith River will not be turbid or change water quality conditions in the MF Smith River. Additionally, the banks of the MF Smith River contain a large quantity of natural vegetation that will buffer any water or sediment that may be released during construction, further minimizing potential effects to water quality from culvert replacement activities. It is not anticipated that SONCC coho salmon will be exposed to effects from culvert activities due to the minimization of sediment entering the wetted channel through the use of BMPs, and the existence of natural vegetation that will act as buffer to minimize effects to water quality from construction activities.

Paving throughout the project area will increase impervious surface by approximately 0.96 acres. This increase in impervious surface may introduce pollutants and runoff into the MF Smith River. Individuals exposed to pollutants and stormwater may experience effects such as, decreased health; increased potential for disease, or mortality; and critical habitat may be affected by an increased likelihood of flooding, and alteration to instream habitat. The areas surrounding the project sites are heavily vegetated and will likely serve to buffer storm runoff generated by the expanded roadway surface. Also, several minimization measures have been

engineered into the new bridge design that will decrease the potential for runoff to enter the MF Smith River. The scuppers on the new bridge were designed to direct flow onto the vegetated banks of the river, increasing infiltration time and decreasing the potential for pollution to enter the Smith River. Stormwater and runoff will be funneled to either side of the bridge and intercepted and filtered by the existing stormdrain network and vegetated buffers. Stormwater runoff from the northern portion of the bridge will drain towards the new biostrip, which will act as an additional filter for stormwater and pollutants before entering the MF Smith River. The existing drainage network and large amount of vegetation will continue to filter out pollutants and runoff from the roadway, and will decrease the quantity of stormwater and concentration of pollutants to a minor level. The quantity of stormwater and pollutants that individuals are exposed to will be small. Therefore, any effects to coho salmon from the increase in impervious surface will be temporary and insignificant.

### **Vegetation Removal**

Riparian vegetation will be removed during construction of the drilling pads, falsework, and foundations for the new bridge at PCN-2, and for the installation of the retaining walls at sites PCN-1, PCN-2, and PCN-3. Effects to critical habitat from removal of vegetation can include decreased streambank stabilization, decreased cover and allocthonous material input, decreased shade, increased water temperature, and sediment mobilization from exposed soil. Effects to individuals from vegetation removal may include decreased fitness, increased disease transmission rates, and exposure to increased water temperatures that can cause stress and decreased fitness. The closer to the wetted channel the vegetation is removed, the higher likelihood that individuals will be exposed to effects. All permanent structures (*i.e.* retaining walls and foundations) will be built above the OHWL, outside of the wetted channel, and do not require the construction of stream diversions. The placement of structures in these areas away from critical habitat or the wetted channel will minimize the potential for adverse effects to individuals by allowing for a buffer of riparian vegetation to exist, which will provide shade, allocthonous material, and maintain soil stability on the streambanks. Minimization measures installed at these locations will include BMPs (see above for types) to prevent sediment mobilization, and planting to restore disturbed areas, will help decrease the probability that individuals will be exposed to effects of vegetation removal. Disturbed areas are expected to revegetate naturally through sprouting and seed dispersal, and areas of the old road alignment at site PCN-2 will be planted with native trees and shrubs, and seeded with native herbaceous vegetation. The above described effects from removal of vegetation will be short term and last through one growing season. Due to the small amount of vegetation proposed for removal, quick regeneration of removed material, proposed planting plan, and the existence of additional plants and trees to provide shade and bank stability, the effects from removal of vegetation will be minimal and temporary and will have an insignificant effect on coho salmon or their critical habitat.

### **Blasting (Noise)**

Controlled blasting to remove rock and other materials from hillslopes may occur at the following locations: (1) at the Narrows location, no closer than 60 feet from the MF Smith River, (2) at the PCN-2 location on the road side of the hillslope, (3) at the PCN-2 location

during bridge construction and demolition of the foundations and columns of the existing bridge. These activities have the potential to cause mortality and injury by creating areas where rock and debris may fall into the MF Smith River and crush fish. The following minimization measures will be installed to decrease the potential for rocks and debris to fall in the MF Smith River: (1) blasting mats installed over area where charges are set off, (2) at the Narrows site, one-foot thick pads of loose dirt placed on the pavement below a set of holes to be blasted, intended to cushion the pavement against rockfall and reduce the tendency of rocks to bounce and roll, and (3) installation of a 6-foot high portable rockfall barrier consisting of heavy chainlink fence and filter fabric mounted on K-rails and placed on the highway centerline. The implementation of these minimization measures will eliminate airborne rocks from entering the MF Smith River.

Blasting of rock and debris, and pile installation has the ability to create noise disturbance that can be harmful or lethal to fish (Caltrans 2009). Effects from these activities may include barotrauma, internal injuries, and mortality. Caltrans will attempt to remove the rock and debris from the PCN-2 site using heavy equipment or drilling, and may not have to use blasting at the location closest to the wetted channel. This will help minimize the potential for effects from noise, since Caltrans may not need to perform this activity. If Caltrans does implement controlled blasting, noise effects from blasting activities are expected to remain below established thresholds because mediums, such as unconsolidated earthen materials (as found at the bridge replacement site) do not effectively transmit sound and sound pressure levels decrease rapidly as distance from the source increases (Caltrans 2012). Recently, other bridge construction projects involved land-based blasting near waterbodies, and monitoring of noise effect displayed sound levels well below established thresholds (Caltrans 2012). Erosion control BMPs similar to those discussed above will be installed at blasting sites, and will minimize the potential for sediment and debris to enter the channel. Given the small likelihood the activity will take place, the installation of BMPs, and the data showing that noise levels will remain beneath certain thresholds (Caltrans 2009), effects to individuals will be insignificant.

To confirm that established sound pressure criteria are not reached, hydroacoustic monitoring will be performed. Hydroacoustic monitoring will take place for select activities having the potential to cause hydroacoustic effects while being performed. If sound pressure levels reach or exceed peak and/or accumulated sound exposure levels (SEL), then blasting and/or pile driving will be stopped immediately and alternative methods will be evaluated (Caltrans 2012). Suitable, accessible habitat exists adjacent to all project locations, and individuals in the area will likely use avoidance behavior response to leave the area where construction and pile driving activities occur. The ability for individuals to escape exposure to noise disturbance, and the use of hydroacoustic monitoring will minimize the effects of pile driving and noise disturbance to an insignificant level.

## **ESA DETERMINATION**

Based on a review of the documents provided by Caltrans, NMFS concurs with Caltrans' determination that the Project may affect, but is not likely to adversely affect SONCC coho salmon or their critical habitat.

Reinitiation of consultation may be necessary where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and if: (1) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered, (2) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered, or (3) a new species is listed or critical habitat designated that may be affected by the action.

## **EFH CONSULTATION**

The Pacific Fishery Management Council has delineated EFH for Pacific Coast salmon, which includes the MF Smith River, where parts of the project will take place. The Project is located within an area identified as EFH for various life stages of coho salmon and Chinook salmon managed under the Pacific Coast Salmon Fishery Management Plan (FMP) under the MSFCMA. NMFS has evaluated the Project for potential adverse effects to EFH pursuant to section 305(b)(2) of the MSFCA. Under the EFH implementing regulations [50 C.F.R. 600.810(a)], the term "adverse effect" is defined as "any impact that reduces quality and/or quantity of EFH and may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce quantity and/or quality of EFH."

The anticipated adverse effects to EFH from the Project are from temporary increases in sediment and turbidity and exposure to noise pollution (as previously described in this LOC). The increases in sediment and turbidity are expected to be minor, and no changes are likely in the long term quality of the MF Smith River. Exposure to noise pollution will occur during blasting activities. Caltrans stated in their consultation initiation letter that the project would not adversely affect EFH, however, the accompanying BA identified potential adverse effects to EFH, and stated in the EFH Assessment that the project would adversely affect EFH. NMFS agrees with the latter determination in the BA, and has determined that the Project would adversely affect EFH for coho salmon and Chinook salmon. The proposed project contains measures to avoid, minimize, mitigate, or otherwise offset the adverse effects to EFH. NMFS has no additional measures to provide as EFH conservation recommendations. Pursuant to 50 CFR § 600.920(1), Caltrans must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a manner that may adversely affect EFH.

## **FWCA CONSULTATION**

The purpose of the FWCA is to ensure that wildlife conservation receives equal consideration, and is coordinated with other aspects of water resources development (16 U.S.C. § 661). The FWCA establishes a consultation requirement for Federal departments and agencies that undertake any action that proposes to modify any stream or other body of water for any purpose, including navigation and drainage [16 U.S.C. § 662(a)]. Consistent with this consultation requirement, NMFS may provide recommendations and comments to Federal action agencies for the purpose of conserving fish and wildlife resources. The FWCA allows the opportunity to offer recommendations for the conservation of species and habitats beyond those currently

managed under the ESA and the MSFCMA. NMFS has no additional recommendations under the FWCA as the Project, as proposed, will not affect the conservation of fish species or their habitats.

Please contact Mrs. L. Kasey Sirkin at (707) 825-1620, or via email at [kasey.sirkin@noaa.gov](mailto:kasey.sirkin@noaa.gov), if you have any questions regarding these consultations.

Sincerely,



Rodney R. McInnis  
Regional Administrator

CC: Copy to File - 51422SWR2010AR00037

#### References

California Department of Transportation (Caltrans). 2009. Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish. Prepared by ICF, Jones & Stokes and Illingworth and Rodkin.

California Department of Transportation (Caltrans). 2012. Biological Assessment for impacts to Coho salmon (*Oncorhynchus kisutch*), designated critical habitat and Essential Fish Habitat for 197/199 SAFE STAA Access Project, at seven locations on Routes 197 and 199 near the Smith River and the Middle Fork Smith River. 72 pp + appendices.



# United States Department of the Interior



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In Reply Refer To:  
AFWO-10B0003-10F0090

SEP 13 2012

Kathleen Sartorius  
Senior Environmental Planner  
Environmental Management Branch E-1  
California Department of Transportation, District 1  
P. O. Box 3700  
Eureka, California 95502-3700

Subject: Formal Consultation for the 197/199 SAFE STAA Access Project, Del Norte County, California

Dear Ms. Sartorius:

This document transmits the Fish and Wildlife Service's (Service) biological opinion based on our review of the proposed 197/199 SAFE STAA Access Project, Del Norte County, California, and its effects on the federally threatened northern spotted owl (*Strix occidentalis caurina*; spotted owl). This document was prepared in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act). Your request for formal consultation, dated March 13, 2012, was received on March 15, 2012.

This biological opinion is based on information provided in the March 15, 2012, biological assessment provided by the California Department of Transportation (Caltrans), correspondence between Caltrans environmental planning staff and the Service, field investigations, and other sources of information. A complete decision record of this consultation is on file at this office.

In your March 13, 2012, request for formal consultation, you also requested concurrence from the Service for a may affect, not likely to adversely affect determination for the federally threatened marbled murrelet (*Brachyramphus marmoratus*; murrelet) at all seven project locations (two on State Route 197 [SR 197]; five on U.S. Route 199 [US 199]), and for the spotted owl at five (Ruby 1, Ruby 2, Patrick Creek Narrows [PCN]-1, PCN-3, and Washington Curve) of the seven project locations. In addition, you determined that the proposed actions within all seven project locations would not affect designated spotted owl critical habitat, because spotted owl critical habitat does not occur within the action area of any of the seven project locations. Finally, you determined that designated murrelet critical habitat only occurred

within the action area of the Ruby 2 project location on SR 197, but that proposed construction activities at Ruby 2 would not adversely affect critical habitat because no habitat would be modified or destroyed.

The Service concurs with Caltran's determination that the project may affect, but is not likely to adversely affect the murrelet at all seven project locations and for the spotted owl at five of the seven project locations (all except The Narrows [Narrows] and PCN-2 project locations) based on conservation measures included in Caltran's biological assessment, such as daily noise restrictions in the vicinity of suitable murrelet nesting habitat and seasonal restrictions (*i.e.*, outside the nesting season) on the removal of suitable spotted owl or murrelet nest trees.

Although suitable spotted owl and murrelet nest trees occur within the vicinity of all five project locations (Ruby 1, Ruby 2, PCN-1, PCN-3, and Washington Curve), the trees occur close to the roadway, as individuals or in very small linear strips, and are thus likely unsuitable for nesting spotted owls or murrelets. Further, auditory and visual disturbance from vehicular traffic, private residences, road maintenance crews, and commercial businesses at these locations suggests an extremely low probability that nesting birds would occupy trees within the action areas of those five locations.

The Service concurs with Caltran's determination that the proposed action would not adversely affect or destroy designated murrelet critical habitat at the Ruby 2 project location. Caltrans noted that construction-generated noise above ambient noise levels will penetrate murrelet critical habitat at the Ruby 2 project location. However, the Service determined that the portion of designated murrelet critical habitat at Ruby 2 that may be exposed to above-ambient noise levels lacks suitable nest trees (a primary constituent element of murrelet critical habitat) for murrelets. Therefore, the probability of murrelets nesting in the vicinity of Ruby 2 would be extremely low.

### **Consultation History**

- **July 23, 1998:** The Service received a public notice for a Caltrans open house to describe the proposed widening of US 199 from north of Patrick's Creek Lodge, through the "Narrows" to just north of "Blue Slide".
- **January 28 to March 18, 2008:** The Service received several emails from Caltrans environmental planners with attached photographs, diagrams, and text that briefly described the proposed project.
- **April 3, 2008:** The Service made a field site visit to the two proposed project sites near Ruby van Deventer Park on SR 197. The site visit included California Department of Fish and Game (CDFG) consulting biologist Mike Van Hattem and Jack Miller of Caltrans.
- **May 7, 2008:** The Service discussed (via telephone) with Caltrans possible listed species that may be impacted by the project, seasonal restriction date ranges for the spotted owl

and murrelet, and the expected type of consultation (informal vs. formal) for the project based on preliminary information received from Caltrans.

- **July 17, 2008:** The Service replied to Gail Popham (new Caltrans point of contact for the project), indicating that there may be effects to listed species at one or more of the project locations, and that a Service representative would attend a project meeting at the Caltrans District 1 office on July 28, 2008.
- **September 14, 2009:** Service staff made a field site visit (all 7 locations) to determine whether formal section 7 consultation would be required for the project. The site visit was also attended by a California Department of Fish and Game biologist.
- **June 6 to July 20, 2010:** Multiple emails regarding bridge replacement at PM 24.0 (PCN-2 project location) on US 199 exchanged between the Service and Caltrans.
- **August 2, 2010:** The Service emailed the results of 2010 spotted owl surveys conducted by the Six Rivers National Forest to Gail Popham of Caltrans. The Service had requested current information from the U.S. Forest Service on the spotted owl territory just south of the Middle Fork Smith River Bridge located at PM 24.0 on US 199 (PCN-2 project location) as part of their assessment of potential noise impacts during the geotechnical drilling phase of bridge construction, which occurred in 2011.
- **August 3, 2010:** The Service sent Gail Popham of Caltrans an email regarding geotechnical drilling and potential impacts to nesting spotted owls at project location PCN-2 at PM 24.0 on US 199. The Service stated that since it was already August and the geotechnical drilling had not yet started, noise disturbance should not be an issue, because the seasonal noise restriction for nesting spotted owls ends on August 1. Although the murrelet nesting season ends on September 15, Six Rivers National Forest, Smith River National Recreation Area, wildlife biologist Brenda Devlin believed that the area was unlikely to have nesting murrelets; because the habitat was 20 miles from the Pacific Coast and immediately adjacent to US 199. The nearest documented murrelet nest is approximately 15 miles to the west of PCN-2.
- **October 5, 2010:** The Service received results from a technical study on noise levels expected to be generated during geotechnical drilling at PM 23.8/24.1 on US 199 (project location PCN-2) from Caltrans. This geotechnical drilling was conducted to determine the best location for bridge piles.
- **October 15, 2010:** Gail Popham, Caltrans's environmental point of contact for the project, requested technical assistance on proposed geotechnical drilling for the bridge at PM 24.0 on US 199. Gail provided the Service with results of long-term geotechnical drilling noise monitoring. The Service reviewed the noise data and concluded that the noise of geotechnical drilling would have *no effect* on nesting spotted owls or murrelets.

- **November 18, 2010:** The Service discussed (via two emails) possible determinations for potential impacts to the spotted owl and murrelet at all seven project locations with Caltrans environmental planner, Gail Popham.
- **January 6, 2011:** The Service conducted a field site visit to all seven proposed project locations to make a qualitative determination of the potential suitability of surrounding habitat for nesting spotted owls and murrelets. The Service also assessed potential impacts of removing trees and other vegetation and noise disturbance to listed species.
- **March 9, 2011:** Gail Popham, Caltrans point of contact for this project contacted the Service regarding whether consultation should be for the project as a whole or split up by project location. The Service recommended that she make a determination of the potential impacts to the spotted owl and/or murrelet for each of the 7 project locations then request informal or formal consultation as a group. That is, request formal consultation for one or more of the project locations and request informal consultation for others project locations.
- **December 28, 2011:** The Service received a draft biological assessment from Caltrans point of contact, Gail Popham, for potential impacts to the spotted owl and murrelet.
- **January 26, 2012:** a Service representative attended a meeting at Caltrans District 1 office to discuss timing of Service review of environmental documents and writing of a biological opinion. Caltrans project engineer, Kevin Church, requested a very short turn-around for the biological opinion. The Service mentioned that the consultation would be a priority for the Service representative working on Caltrans consultations, but that the truncated timeline for the biological opinion may be difficult to meet.
- **February 2, 2012:** The Service sent an electronic version of Caltrans' biological assessment, with comments and questions as track changes, back to Caltrans environmental planner, Gail Popham. Primary issues were inconsistent statements made throughout the document and the timing of [loud] noise-generating activities and tree removal. The Service also was unclear on what was meant by spotted owl "surveys" mentioned throughout the document.
- **February 8, 2012:** The Service received a phone call from Caltrans environmental planner and Point of Contact, Gail Popham, regarding Service comments and questions on her draft biological assessment for the project. Primary issues discussed were: (1) best date range for conducting blasting at the PCN-2 and Patrick Creek Narrows sites to minimize or avoid impacts to nesting spotted owls, and (2) the need to remove potentially suitable spotted owl nest trees at PCN-2 outside the NSO nesting season to avoid the take of spotted owls at that location.
- **February 10, 2012:** The Service sent an email to Caltrans to initiate a discussion of possible spotted owl surveys that could be conducted at the two action areas, the Narrows and PCN-2, where long-term excavation and other noise-generating activities will occur.

- **February 13, 2012:** The Service and Caltrans discussed whether or not spotted owl surveys should be conducted within suitable nesting\roosting habitat in the action areas of PCN-2 and the Narrows project locations. The Service recommended that Caltrans conduct an activity center survey for the Dollar Bend spotted owl territory prior to construction.

## **BIOLOGICAL OPINION**

The proposed action includes road construction activities at two locations on SR 197 and five locations on US 199. However, adverse effects to spotted owls are expected at only two of the seven project locations (PCN-2 and the Narrows), both on US 199. Therefore, this biological opinion will only consider potential impacts to the spotted owl at PCN-2 and the Narrows project locations. Concurrence for a may affect, not likely to adversely affect determination for the murrelet at all seven locations, and for the spotted owl at five (Ruby 1, Ruby 2, PCN-1, PCN-3, and Washington Curve) of the seven project locations was provided in the introductory paragraphs above.

### **DESCRIPTION OF THE PROPOSED ACTION**

The proposed action consists of road and/or bridge construction at two locations on US 199, east of US 101, Del Norte County, California: (1) The Narrows, at Post Mile (PM) 22.7 to 23.0, Hurdygurdy Butte Quadrangle, T17N, R3E, Sec. 16, and (2) Patrick Creek Narrows 2 (PCN-2) at PM 23.9 to 24.1, Shelly Creek Ridge Quadrangle, T17N, R3E, Sec. 10.

Both locations have roadway geometries that can result in Federal Surface Transportation Assistance Act of 1982 (STAA) trucks and other long-wheelbase vehicles off-tracking across the double yellow line and entering the oncoming traffic lane. Additionally, limited sight distances at both locations does not allow enough time for drivers to react to roadway conditions ahead.

Within the project limits, US 199 traverses the Middle Fork Smith River canyon, a state- and federally-designated Wild and Scenic River. US 199 is designated as a U.S. Forest Service (USFS) Scenic Byway through the Smith River National Recreation Area. US 199 is also listed as eligible for inclusion in the State Scenic Highway system. However, Del Norte County has yet to initiate the official designation process. The roadway alignment of 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 connects US 101 (north of Crescent City, California) to Interstate 5 at Grants Pass, Oregon.

#### *The Narrows Project Location*

The travel lanes at the Narrows currently vary from 10 to 12 feet with no shoulders. Work at this location would increase lane widths to 12 feet and add 2-foot shoulders. Road widening will be accomplished by excavating into the existing cut slope on the north side of US 199. Soft material in the cut slope will be removed with mechanical equipment, such as an excavator. For rocky

portions of the cut slope, the cut limits will be established by presplitting the final slope face with controlled blasting. Drilling for the placement of explosives would be done by crane, a track-mounted drill, or by hand.

In addition to roadway widening, isolated outcrops of overhanging or loose rock above the excavation limits will be stabilized by scaling off the loose material and, where necessary, adding cable drape or rock bolting. Other work includes an overlay of new open graded asphalt concrete pavement to improve friction and traction, a centerline rumble strip and new striping. Existing gravel pullouts nearby will be used to stage equipment.

A one-foot-wide paved drainage ditch will be added along the inboard shoulder of the road for a total paved width of 29 feet. One new culvert and drain inlet will be added and an existing culvert and drain inlet will be replaced to match the new edge of pavement.

Approximately 5,500 cubic yards of excess material, most of which is rock, will be generated by the work at the Narrows. It will be disposed of at one of several optional sites that have been environmentally cleared and made available for the contractor's use. The removal of 46 trees at The Narrows includes the potential removal of one 24 inch diameter-at-breast-height (dbh) Douglas-fir (*Pseudotsuga menziesii*) that is immediately next to the guardrail, high on the bank of the Middle Fork Smith River, approximately 90 feet from the Ordinary High Water (OHW) level. The remaining 45 trees that will be removed are smaller and on the cut slope north of the roadway. Earthmoving equipment includes excavators or bulldozers with slope boards and ripper teeth. Jackhammers mounted on an excavator and/or "hoe rams" will also be required. Other equipment includes cranes, hydraulic boom lifts, backhoes, dump trucks, front end loaders, graders, asphalt pavers and vibratory rollers (used for compacting the new asphalt concrete). Approximately 120 working days over two construction seasons (June–October) will be required to complete the work at this project location.

### *PCN-2 Project Location*

The existing arch bridge at this project location was constructed in 1925 and is only 24 feet wide. Three alternatives for improvements were considered at this location. The alternative that included replacing the bridge downstream from the current location was selected because it avoided excavation of the geologically unstable cut-slope formation upstream of the existing bridge.

The existing arch bridge will be replaced with a wider arch bridge that consists of a 215-foot arch portion on the northern end over the Middle Fork Smith River and a 155-foot viaduct portion over land at the southern end of the bridge. The first three spans of the bridge (moving from south to north on US 199) will be 20 feet wide, and the remainder of the bridge (including a portion of the viaduct) will be 45 feet wide. The bridge superstructure will be a cast-in-place concrete slab. The foundation type for all of the piers and abutments of the new bridge will be cast-in-drilled-hole (CIDH) piles. The diameter of the CIDH piles will be between two and four feet. A 145-foot retaining wall will be constructed on the east side of US 199 south of the viaduct and a smaller retaining wall will be built near the northern end of the bridge.

To accommodate road widening and realignment at the southern extent of this project location, approximately 20,000 cubic yards of rock from the cut slope will be excavated. Rock excavation will extend up to approximately 150 feet above the highway and expose approximately 1 acre of newly excavated rock slope. A hoe ram or rock splitter will be required to construct the rock cut slope. However, rock removal may require controlled blasting. A rock drill would be used to drill holes in the bedrock to install small explosive charges for blasting. 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 will consist of a wire-mesh drape or incorporate a rock-fall catchment area at roadway level. Improvements at PCN-2 would also include an open graded asphalt concrete overlay to improve friction and traction, striping, centerline rumble strip, metal beam guardrail, and shoulder backing. One culvert will be replaced and lengthened to match the new roadway width.

After the new bridge is constructed, the existing bridge will be removed. A demolition plan and debris containment plan will be prepared, including provisions to minimize debris entering the Middle Fork Smith River. The existing spread footing foundations would be cut off flush at the ground surface when they are on bedrock or within ordinary high water, or they would be cut 3 feet below the finish grade and backfilled with native soil, when they are in soil and above ordinary high water.

Approximately 3 acres will be disturbed by the work planned at this location. Tree removal and clearing and grubbing of vegetation within proposed limits of construction activities would occur prior to ground disturbance by construction activities. Approximately 108 trees, plus some shrubs and herbaceous vegetation, will be removed from the area of the proposed alignment. Portions of the old roadway northwest of the old bridge and directly adjacent to the old bridge will be removed.

Approximately 300 working days over three construction seasons (June–October) will be required to complete the work at this project location. Some night work and full road closures are anticipated. The slope will be cut during the first construction season, and one or both retaining walls will be constructed. In the second season, the bridge (and possibly the remaining retaining wall, if not built in the first season) will be built. In the third season, the old bridge will be demolished.

Equipment required at this project location includes; backhoe or excavator equipped with a jackhammer, front-end loader, fork lift, crane, dump trucks, concrete saws, large cranes, drilling rigs, hoe rams, guardrail post driver, pavement grinders, graders, backhoes, haul and dump trucks, loaders, air compressors, boom trucks, jack hammers, storage containers, mobile filtration (baker tanks), pavement saws, generators, compacting equipment, paving equipment, vibratory rollers, and concrete trucks. The drainage work would likely require the use of a backhoe, excavator, hauling and dump trucks, concrete trucks, portable generator, boom truck, vibratory hammer, and pump. Equipment used to remove rock, durable rocky material and earthen material may include; hydraulic hammer, pneumatic hammer, or controlled blasting. An air spade might be used for excavating around the existing culverts to minimize root impacts to trees. Total road closures would be required for short durations. Blasting would only occur during daylight hours and under traffic control.

For details on proposed construction methods and materials used for these two project locations please refer to Caltran's biological assessment and construction layouts for this project and Caltran's standard plans and specifications; all on file at this office.

### ***Conservation Measures***

When used in the context of the Act, "conservation measures" represent actions proposed by the project proponent that are intended to further the recovery of and/or to minimize or compensate for project effects on the species under review. Because conservation measures are pledged in the project description by the action agency, their implementation is required under the terms of the consultation (Service and NMFS 1998).

1. Blasting at PCN-2 and the Narrows will be conducted outside the spotted owl nesting season (*i.e.*, only between July 10 and January 31) to avoid noise disturbance to spotted owls that may be nesting within suitable habitat that is present within the action area of both project locations.
2. Immediately prior to the first construction season for PCN-2, Caltrans will conduct surveys for the resident spotted owl pair (Dollar Bend pair) to determine the current location of their activity center. If, after surveys, it is determined that the Dollar Bend pair territory activity center has moved to within 825 feet of US 199 (and thus within the area that will be exposed to elevated action-generated sound levels) Caltrans will reinitiate section 7 consultation with the Service.
3. Removal of the two large (dbh  $\geq$ 31.5 inches ) Douglas-fir trees at PCN-2 and one 24-inch dbh Douglas-fir tree at the Narrows will occur after September 15, but before January 31 of the following year, to avoid adverse impacts to nesting adult spotted owls, eggs, or nestlings.
4. Removal of all other vegetation at PCN-2 and the Narrows will also occur after September 15, but before January 31 of the following year, to avoid the destruction of active (*i.e.*, containing eggs or young) migratory bird nests. However, if tree and shrub removal (excluding the Douglas-fir trees listed above) at either location is required during the migratory bird nesting season, surveys for active bird nests will be completed prior to any vegetation being removed. The following nest survey procedures will be implemented:
  - a. A qualified biologist must conduct the bird nest surveys, and determine whether detected nests are active.
  - b. If an active nest is detected during surveys, the project's Resident Engineer and Project Biologist will be notified immediately. Inactive nests (*i.e.*, those that do not yet contain eggs or nestlings) may be removed.
  - c. All active nests will either be isolated (with protective fencing or similar barrier) from construction activities or if the nest(s) cannot be avoided, activities will be suspended.

These protective measures will remain in place until the juveniles have fledged, or the nest has failed.

- d. Caltrans must notify the Service when active nests are detected and the measures taken to avoid “take” of eggs and/or nestlings.

### ***Definition of the Action Area***

The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR §402.02). The portion of the action area at the Narrows location includes a 0.3-mile segment of US 199, excavation limits for widening the road, and areas on either side of the road that may be exposed to above-ambient sound levels from construction activities. The portion of the action area at the PCN-2 location includes a 0.2-mile segment of US 199, excavation limits for widening the road, adjacent areas where trees and other vegetation will be removed, the bridge over the Middle Fork Smith River, and areas on either side of the road that may be exposed to above-ambient sound levels from construction activities.

The maximum ambient sound level on US 199 at the two project locations, as measured by Caltrans, was 61 A-weighted decibels (dBA) during nighttime hours (10:00 PM to 7:00 AM) and 63 dBA during daytime hours (7:00 AM to 10:00 PM). Caltrans estimated the maximum action-generated sound level for both project locations at between 90 and 100 dBA. Based on the Service’s guidance for estimating “harassment” (a form of “take” under the Act) distance for nesting spotted owls due to elevated (*i.e.*, above ambient levels) action-generated sound levels (Service 2006), the harassment distance for action-generated noises of 90–100 dBA with maximum ambient sounds levels of 61–63 dBA would be 825 feet (250 meters). That is, potential “harassment” of nesting spotted owls at the two project locations could occur within 825 feet of proposed actions, but action-generated sound levels would attenuate to ambient levels beyond that distance. The Service placed an 825-foot buffer around the road segments and adjacent areas that will be affected by the proposed actions to estimate the total area (*i.e.*, the action area) around each project location where nesting spotted owls may be affected by elevated sound levels. The resulting action area for the PCN-2 project location was 120 acres (49 hectares) and the Narrows 88 acres (36 hectares).

### **STATUS OF THE NORTHERN SPOTTED OWL**

This section summarizes the legal and biological status, and key threats to the northern spotted owl within its historic range. Appendix A provides a detailed description of the species and threats to its continued existence. For this consultation, the Service has considered all information provided in Appendix A in its assessment of the project effects. The following summary describes those aspects of the species’ ecology and its threats that have a direct bearing on the analysis of the proposed action being considered in this consultation.

### ***Legal Status***

The northern spotted owl was listed as threatened on June 26, 1990 due to widespread loss and adverse modification of suitable habitat across the owl's entire range and the inadequacy of existing regulatory mechanisms to conserve the subspecies (55 FR 26114). On June 28, 2011, the Service completed a Revised Recovery Plan for the northern spotted owl (Service 2011).

Critical habitat for the northern spotted owl was first designated in 1992 (57 FR 1796), and revised in 2008 (73 FR 47326). The 2008 critical habitat designation included approximately 5,312,300 acres (2,149,800 hectares) of Federal lands in California, Oregon and Washington. On March 8, 2012, the Service proposed to revise critical habitat identifying approximately 13,962,449 acres (5,650,403 hectares) that meet the definition of critical habitat in 11 units and 63 subunits in California, Oregon, and Washington (77 FR 14062).

### ***Taxonomy and Range***

The northern spotted owl is one of three subspecies of spotted owls currently recognized by the American Ornithologists' Union: northern subspecies, Mexican subspecies (*S. o. lucida*), and California subspecies (*S. o. occidentalis*). The current range of the northern spotted owl extends from southwest British Columbia through the Cascade Mountains, coastal ranges, and intervening forested lands in Washington, Oregon, and California, as far south as Marin County (55 FR 26114). The range of the northern spotted owl has been partitioned into 12 physiographic provinces (Appendix A: Figure 1) based on recognized landscape subdivisions exhibiting different physical and environmental features since 1990. The Revised Recovery Plan (Service 2011) adopted the physiographic provinces as recovery units with the exception of the Willamette Valley, because that area contained large amounts of non-habitat.

### ***Biology and Ecology***

The northern spotted owl is a medium-sized owl and is the largest of the three subspecies of spotted owl (Gutiérrez 1996). They spend virtually their entire lives beneath the forest canopy (Courtney *et al.* 2004) seeking sheltered roosts to avoid inclement weather, summer heat, and predation (Forsman 1976, 1980; Barrows and Barrows 1978; Barrows 1981; Forsman *et al.* 1984; Ting 1998). Northern spotted owls are primarily nocturnal (Forsman *et al.* 1984), foraging between dusk and dawn and sleeping during the day with peak activity occurring during the two hours after sunset and the two hours prior to sunrise (Forsman *et al.* 1984; Gutiérrez *et al.* 1995; Delaney *et al.* 1999). Their diet varies geographically and by forest type. Generally, flying squirrels (*Glaucomys sabrinus*) are the most prominent prey for northern spotted owls in Douglas-fir and western hemlock (*Tsuga heterophylla*) forests (Forsman *et al.* 1984) in Washington (Hamer *et al.* 2001) and Oregon, while dusky-footed wood rats (*Neotoma fuscipes*) are a major part of the diet in the Oregon Klamath, California Klamath, and California Coastal provinces (Forsman *et al.* 1984; 2004; Ward *et al.* 1998).

The northern spotted owl is relatively long-lived, has a long reproductive life span, invests significantly in parental care, and exhibits high adult survivorship relative to other North American owls (Gutiérrez *et al.* 1995). Most pairs do not nest every year, and nesting pairs are

not successful every year (Forsman *et al.* 1984, Anthony *et al.* 2006). Courtship behavior usually begins in February or March, and females typically lay eggs in late March or April. The timing of nesting and fledging varies with latitude and elevation (Forsman *et al.* 1984). Natal dispersal of northern spotted owls typically occurs in September and October with a few individuals dispersing in November and December (Forsman *et al.* 2002).

Northern spotted owls are territorial, actively defending their nests and young from predators (Forsman 1976; Gutiérrez *et al.* 1995). They will regularly confront other spotted owls with aggressive vocal displays (Forsman 1976, 1980; Forsman *et al.* 1984; Gutiérrez *et al.* 1995; Franklin *et al.* 1996). However, home ranges of adjacent pairs overlap (Forsman *et al.* 1984; Solis and Gutiérrez 1990) suggesting that the area defended is smaller than the area used for foraging. Median annual home range size varies from 985 acres in the California Coast Redwood Region to 14,211 acres on the Olympic Peninsula. Within the home range, there is a core area of concentrated use (approximately 20 percent of the home range) during the breeding season (Bingham and Noon 1997).

### ***Habitat Use***

Forsman *et al.* (1984) reported that northern spotted owls have been observed in many forest types, including Douglas-fir, western hemlock, grand fir (*Abies grandis*), white fir (*Abies concolor*), ponderosa pine (*Pinus ponderosa*), Shasta red fir (*Abies magnifica shastensis*), mixed evergreen, mixed conifer-hardwood, and coast redwood (*Sequoia sempervirens*), and generally rely on older forested habitats containing the structures and characteristics required for nesting, roosting, and foraging. Such features typically include moderate to high (60 to 90 percent) canopy closure; a multi-layered, multi-species canopy with large overstory trees of 30 inches or greater dbh; large trees with various deformities and decadence; large snags; large accumulations of woody debris; and open space below the canopy (Thomas *et al.* 1990). Foraging activity is associated with tree height diversity (North *et al.* 1999), canopy closure (Irwin *et al.* 2000, Courtney *et al.* 2004), snag volume, density of snags greater than 20 in. (50 cm) dbh (North *et al.* 1999, Irwin *et al.* 2000, Courtney *et al.* 2004), density of trees  $\geq$  31 in. (80 cm) dbh (North *et al.* 1999), volume of woody debris (Irwin *et al.* 2000), and other structural characteristics of old forests (Carey *et al.* 1992, Irwin *et al.* 2000). Dispersal habitat consists of stands with adequate tree size and canopy closure to provide protection from avian predators and opportunities to forage. A mosaic of late-successional habitat interspersed with other seral conditions may benefit northern spotted owls more than large, homogeneous expanses of older forests (Zabel *et al.* 2003; Franklin *et al.* 2000; Meyer *et al.* 1998).

### ***Threats***

The 2011 revised recovery plan for the northern spotted owl indicates that past and current habitat loss from timber harvest and wildfire, and competition from barred owls are the most pressing threats to northern spotted owl recovery. Addressing the threats associated with past and current habitat loss must be conducted simultaneously with addressing the threats from barred owls (Service 2011).

At the time of listing, there was recognition that large-scale wildfire posed a threat to northern spotted owl habitat (55 FR 26114). Studies indicate that the effects of wildfire vary with fire intensity, severity and size. Within fire-adapted forests, northern spotted owls have adapted to withstand fires of variable sizes and severities. However, fire is often considered a primary threat to spotted owls because of its potential to rapidly alter habitat (Bond *et al.* 2009), and is a major cause of habitat loss on Federal lands (Courtney *et al.* 2004). Hanson (2009) believed northern spotted owls suffer adverse consequences from a deficit of fire that creates habitat necessary for an abundance of their key prey species. Climate change is expected to make unpredictable changes to habitat, due to warmer temperatures increasing the probability of severe fire and length of fire season (Skinner 2007).

Barred owls may be exacerbating the northern spotted owl population decline by reducing northern spotted owl site occupancy, reproduction, and survival (Dark *et al.* 1998; Gutiérrez *et al.* 2004; Courtney *et al.* 2004; Olson *et al.* 2005; Anthony *et al.* 2006). Barred owls compete with northern spotted owls for prey (Hamer *et al.* 2001, 2007; Gutiérrez *et al.* 2007; Livezey and Fleming 2007) and habitat (Hamer *et al.* 1989; Dunbar *et al.* 1991; Herter and Hicks 2000; Pearson and Livezey 2003; Singleton *et al.* 2010). Barred owl presence also affects the monitoring and management of northern spotted owls due to a reduction in detectability, when barred owls are present (Kelly *et al.* 2003; Courtney *et al.* 2004; Olson *et al.* 2005; Crozier *et al.* 2006).

### ***Population Status***

Two recent (January 2009) meta-analyses modeled rates of population change for up to 24 years using the re-parameterized Jolly-Seber method ( $\lambda_{RJS}$ ) (Forsman *et al.* 2011). Point estimates of  $\lambda_{RJS}$  were all  $<1.0$  (range 0.929 to 0.996) for 11 long-term study areas, with strong evidence that populations declined (i.e.,  $\lambda_{RJS}$  significantly  $<1.0$ ) on 7 of the 11 areas, including Rainier, Olympic, Cle Elum, Coast Range, HJ Andrews, Northwest California and Green Diamond (Forsman *et al.* 2011). On Tyee, Klamath, Southern Cascades, and Hoopa, populations were either stable or the precision of the estimates was not sufficient to detect declines. In the second meta-analysis, the mean  $\lambda_{RJS}$  of 0.972 (SE = 0.006, 95 percent CI = 0.958 to 0.985) was reported for the eight demographic monitoring areas (Cle Elum, Olympic, Coast Range, HJ Andrews, Tyee, Klamath, Southern Cascades and Northwest California) included in the effectiveness monitoring program of the Northwest Forest Plan (NWFP), an estimated decline of 2.8 percent per year. Forsman *et al.* (2011) indicated that the number of declining populations on study areas in Washington and northern Oregon together with their rates of decline are concerning for the long-term sustainability of northern spotted owl populations.

### ***Conservation and Recovery***

The 2011 revised recovery plan (Service 2011) identifies three main priorities for achieving recovery: (1) protecting the best of its remaining habitat, (2) actively managing forests to improve forest health, and (3) reducing competition from barred owls.

The NWFP continues to guide the management of Federal forest lands within the range of the northern spotted owl (USFS and Bureau of Land Management [BLM] 1994a, 1994b), protecting

large blocks of late-seral forest, and providing habitat for species, including the northern spotted owl, that depend on those forests.

The Service presumes that private lands will provide habitat connectivity between Federal Lands and will contribute demographic support (pair or cluster protection) to Federal lands. There are 15 current and ongoing habitat conservation plans (HCP) that have incidental take permits issued for spotted owls—eight in Washington, three in Oregon, and four in California (Service 2011). The HCPs range in size from 40 acres to more than 1.6 million acres. HCPs cover approximately 2.9 million acres (9.1 percent) of the 32 million acres of non-Federal forest lands in the range of the northern spotted owl, with terms ranging from 5 to 100 years.

### ***Range-wide Habitat Baseline***

The Service has used information provided by the USFS, BLM, and National Park Service to update the habitat baseline conditions on Federal lands for northern spotted owls on several occasions, since the northern spotted owl was listed in 1990. The estimate of 7.4 million acres used for the NWFP in 1994 (USFS and BLM 1994b) was believed to be representative of the general amount of northern spotted owl habitat on these lands. This baseline has been used to track relative changes over time in subsequent analyses, including those presented here. Reliable habitat baseline information for non-Federal lands is not available (Courtney *et al.* 2004); consequently, consulted-on acres can be tracked, but not evaluated in the context of change with respect to a reference condition on non-Federal lands.

In 2001, the Service conducted an assessment of habitat baseline conditions, the first since implementation of the NWFP (Service 2001). This range-wide evaluation of habitat, compared to the Final Supplemental Environmental Impact Statement (FSEIS; USFS and BLM 1994b), was necessary to determine if the rate of potential change to northern spotted owl habitat was consistent with the change anticipated in the NWFP. In particular, the Service considered habitat effects that were documented through the section 7 consultation process since 1994. In general, the analytical framework of these consultations focused on the reserve and connectivity goals established by the NWFP land-use allocations (USFS and BLM 1994a), with effects expressed in terms of changes in suitable northern spotted owl habitat within those land-use allocations. The Service determined that actions and effects were consistent with the expectations for implementation of the NWFP from 1994 to June 2001 (Service 2001).

### ***Range-wide Analysis 1994–September 5, 2012***

This section updates the information considered in Service (2001), relying particularly on information in documents the Service produced pursuant to section 7 of the Act and information provided by NWFP agencies on habitat loss resulting from natural events (*e.g.*, fires, windthrow, insect and disease). To track impacts to northern spotted owl habitat, the Service designed the Consultation Effects Tracking System database, which records impacts to northern spotted owls and their habitat at different spatial and temporal scales. In 2011, the Service replaced the Consultation Effects Tracking System with the Consulted on Effects Database. The Consulted on Effects Database corrected technical issues documented in previous consultations. Data are

entered into the Consulted on Effects Database under various categories including; land management agency, land-use allocation, physiographic province, and type of habitat affected.

In 1994, about 7.4 million acres of suitable northern spotted owl habitat on Federal lands were estimated to exist on Federal lands managed under the NWFP. As of September 5, 2012, the Service had consulted on the proposed removal/downgrading of approximately 192,787 acres (Table 1) or 2.6 percent of the 7.4 million acres of northern spotted owl suitable habitat on Federal lands. Of the total Federal acres consulted on for removal/downgrading, approximately 164,352 acres or 2.2 percent of the 7.4 million acres of northern spotted owl habitat were removed or downgraded as a result of timber harvest. These changes in suitable northern spotted owl habitat are consistent with the expectations for implementation of the NWFP (USFS and BLM 1994a).

April 13, 2004 marked the start of the second decade of the NWFP. Decade-specific baselines and summaries of effects by State, physiographic province and land use function from proposed management activities and natural events are not provided here, but can be calculated using the Service's Consulted on Effects Database.

Habitat loss from Federal lands due to management activities has varied among the individual provinces with most of the effects concentrated within the Non-Reserve relative to the Reserve land-use allocations (Table 2). When habitat loss is evaluated as a proportion of the affected acres range-wide, of the 2.2 percent removed or downgraded as a result of timber harvest, the most pronounced losses have occurred within Oregon (72 percent), especially within its Klamath Mountains (37 percent) and Cascades (East and West) (35 percent) provinces (Table 2), followed by smaller habitat losses in Washington (9 percent), and California (18 percent; Table 2). When habitat loss is evaluated as a proportion of provincial baselines, the Oregon Klamath Mountains (20 percent), Cascades East (13 percent), and the California Klamath (7 percent) provinces all have proportional losses greater than the loss of habitat across all provinces (5.9 percent; Table 2).

From 1994 through September 5, 2012, habitat lost due to natural events on NWFP lands was estimated at approximately 246,111 acres range-wide (Table 2). About two-thirds of this loss was attributed to the Biscuit Fire that burned over 500,000 acres in southwest Oregon (Rogue River basin) and northern California in 2002. This fire resulted in a loss of approximately 113,451 acres of northern spotted owl habitat, including habitat within five LSRs. Approximately 18,630 acres of northern spotted owl habitat were lost due to the B&B Complex and Davis Fires in the East Cascades Province of Oregon.

Because there is no comprehensive northern spotted owl habitat baseline for non-NWFP Federal lands and non-Federal lands, there is little available information regarding northern spotted owl habitat trends on these lands. Yet, we do know that internal Service consultations conducted since 1992, have documented the eventual loss of 472,772 acres of habitat on non-Federal lands. Most of these losses have yet to be realized because they are part of large-scale, long-term HCPs. Combining effects on Federal and non-Federal lands, the Service had consulted on the proposed removal of approximately 665,559 acres, of northern spotted owl habitat range-wide, resulting from all management activities, as of September 5, 2012 (Table 1).

**Table 1.** Range-wide aggregate of changes to NRF<sup>1</sup> habitat acres from activities subject to section 7 consultations and other causes from 1994 to September 5, 2012.

Land Ownership	Consulted On Habitat Changes <sup>2</sup>		Other Habitat Changes <sup>3</sup>	
	Removed/ Downgraded	Maintained/ Improved	Removed/ Downgraded	Maintained/ Improved
NWFP (FS,BLM,NPS)	192,787	520,871	246,111	39,720
Bureau of Indian Affairs / Tribes	108,210	28,372	2,398	0
Habitat Conservation Plans/Safe Harbor Agreements	295,889	14,430	N/A	N/A
Other Federal, State, County, Private Lands	68,673	21,894	279	0
<b>Total Changes</b>	<b>665,559</b>	<b>585,567</b>	<b>248,788</b>	<b>39,720</b>

<sup>1</sup>Nesting, roosting, foraging (NRF) habitat. In California, suitable habitat is divided into two components; nesting - roosting (NR) habitat, and foraging (F) habitat. The NR component most closely resembles NRF habitat in Oregon and Washington. Due to differences in reporting methods, effects to suitable habitat compiled in this, and all subsequent tables include effects for nesting, roosting, and foraging (NRF) for 1994-6/26/2001. After 6/26/2001 suitable habitat includes NRF for Washington and Oregon but only nesting and roosting (NR) for California.

<sup>2</sup>Includes both effects reported in Service 2001 and subsequent effects reported in the Northern Spotted Owl Consultation Effects Tracking System (web application and database.)

<sup>3</sup>Includes effects to suitable NRF habitat (as generally documented through technical assistance, etc.) resulting from wildfires (not from suppression efforts), insect and disease outbreaks, and other natural causes, private timber harvest, and land exchanges not associated with consultation.

**Table 2.** Aggregate results of all adjusted, suitable habitat (NRF<sup>1</sup>) acres affected by section 7 consultation on NWFP lands for the northern spotted owl; baseline and summary of effects by state, physiographic province and land use function.

Physiographic Province <sup>2</sup>	Evaluation Baseline <sup>3</sup>	Habitat Removed/Downgraded <sup>4</sup>				Habitat Loss to Natural Events <sup>7</sup>	Total	% Provincial Baseline Affected	% Range-wide Effects
		Land Use Allocations		Total	Total				
		Reserves <sup>5</sup>	Non-Reserves <sup>6</sup>						
<b>WA</b>	Eastern Cascades	706,849	4,522	6,392	10,914	14,307	25,221	3.57	5.75
	Olympic Peninsula	560,217	869	1,711	2,580	299	2,879	0.51	0.66
	Western Cascades	1,112,480	1,691	10,870	12,561	3	12,564	1.13	2.86
<b>OR</b>	Cascades East	443,659	2,589	14,309	16,898	40,884	57,782	13.02	13.17
	Cascades West	2,046,472	3,872	66,274	70,146	24,583	94,729	4.63	21.58
	Coast Range	516,577	447	3,994	4,441	66	4,507	0.87	1.03
	Klamath Mountains	785,589	2,631	56,269	58,900	101,676	160,576	20.44	36.59
	Willamette Valley	5,658	0	0	0	0	0	0	0
<b>CA</b>	Cascades	88,237	10	4,820	4,830	329	5,159	5.85	1.18
	Coast	51,494	464	79	543	275	818	1.59	0.19
	Klamath	1,079,866	1,546	9,428	10,974	63,689	74,663	6.91	17.01
	<b>Total</b>	<b>7,397,098</b>	<b>18,641</b>	<b>174,146</b>	<b>192,787</b>	<b>246,111</b>	<b>438,898</b>	<b>5.93</b>	<b>100</b>

<sup>1</sup>Nesting, roosting, foraging (NRF) habitat. In California, suitable habitat is divided into two components; nesting - roosting (NR) habitat, and foraging (F) habitat. The NR component most closely resembles NRF habitat in Oregon and Washington. Due to differences in reporting methods, effects to suitable habitat compiled in this, and all subsequent tables include effects for nesting, roosting, and foraging (NRF) for 1994-6/26/2001. After 6/26/2001 suitable habitat includes NRF for Washington and Oregon but only nesting and roosting (NR) for California.

<sup>2</sup>Defined by the Northwest Forest Plan as the twelve physiographic provinces, as presented in Figure 3&4-1 on page 3&4-16 of the FSEIS. The WA Western Lowlands and OR Willamette Valley provinces are not listed as they are not expected to contribute to recovery.

<sup>3</sup>1994 FSEIS baseline (USDA and USDI 1994).

<sup>4</sup>Includes both effects reported in Service 2001 and subsequent effects reported in the Northern Spotted Owl Consultation Effects Tracking System (web application and database.)

<sup>5</sup>Land-use allocations intended to provide large blocks of habitat to support clusters of breeding pairs. (LSR, ML,SA, CRA)

<sup>6</sup>Land-use allocations intended to provide habitat to support movement of spotted owls among reserves. (AWA, AMA, MX)

<sup>7</sup>Acres for all physiographic provinces, except the Oregon Klamath Mountains, are from the Scientific Evaluation of the Status of the Northern Spotted Owl (Courtney *et al.* 2004) and subsequent effects entered into the Northern Spotted Owl Consultation Effects Tracking System. Acres for the Oregon Klamath Mountains province are from the biological assessment entitled: Fiscal year 2006-2008 programmatic consultation: re-initiation on activities that may affect listed species in the Rogue-River/South Coast Basin, Medford BLM, and Rogue-Siskiyou National Forest and from subsequent effects entered into the Northern Spotted Owl Consultation Effects Tracking System.

## **ENVIRONMENTAL BASELINE (in the Action Area)**

Regulations implementing the Act (50 CFR §402.02) define the environmental baseline as the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions, which are contemporaneous with the consultation process.

### ***Environmental Setting***

The action area is located on US 199 on USFS land within the Smith River National Recreation Area. The Middle Fork Smith River parallels US 199 and bisects the action area through a deeply-incised canyon with steep and rugged topography. The action area is within the California Floristic Province, Northwestern California Region, Klamath Range Subregion (Hickman 1993) and is composed primarily of Douglas-fir forest mixed with hardwoods, such as tanoak (*Notholithocarpus densiflorus*) and canyon live oak (*Quercus chrysolepsis*).

### ***Current Condition in the Action Area***

#### **Habitat**

Approximately three-quarters of the PCN-2 portion of the action area is composed of late-mature and old-growth coniferous forest with high canopy closure (over 80 percent). The remainder of PCN-2 is primarily composed of early- and mid-mature coniferous forest with high canopy closure (over 80 percent). Approximately 60 percent of the Narrows portion of the action area is composed of late-mature (no old-growth in action area) coniferous forest with high total canopy closure (90 percent average for the action area). The remainder of the Narrows is primarily composed of early- and mid-mature coniferous forest with high canopy closure (over 80 percent). A stand-replacing fire in the late 1990s destroyed approximately 20 percent of coniferous forest within PCN-2. The burned area was roughly equally distributed amongst the early-, mid-, and late-mature seral stages. The same fire destroyed approximately 25 percent of coniferous forest within the Narrows, with most destroyed habitat in the early- and mid-mature seral stages.

Approximately 58 percent (69 acres) of the 120-acre PCN-2 portion of the action area is composed of suitable spotted owl nesting/roosting habitat, and another 13 percent (15 acres) is composed of suitable spotted owl foraging habitat. Approximately 59 percent (52 acres) of the 88-acre Narrows portion of the action area is composed of suitable spotted owl nesting/roosting habitat, and another 8 percent (7 acres) is composed of suitable spotted owl foraging habitat. Approximately 69 percent (143 acres) of the 208 acres within the entire action area is composed of suitable spotted owl nesting/roosting/foraging (NRF) habitat, which represents an extremely small fraction of the total NRF habitat within the NWFP area (Table 2).

Approximately 74 percent (370 acres) of the area within 0.5 mile of the Dollar Bend activity center is suitable spotted owl NRF habitat, but only 50 percent (1702 acres) of the area within 1.3 mile of the activity center (considered the home range) is suitable NRF habitat (Table 3).

**Table 3.** Pre-action spotted owl habitat conditions for the Dollar Bend activity center (AC).

	Acres within 0.5 mile of AC	Acres within 1.3 mile of AC
Nesting/Roosting	288	1177
Foraging	82	525
Total	370	1702

Numbers, Distribution, and Reproduction

One active and one historic spotted owl activity center have been documented near the PCN-2 portion of the action area. Spotted owl surveys were conducted by the US Forest Service in 2010, south of PCN-2, to determine the current activity center location for the Cedar Rustic Campground pair territory (DNT0011), which was last detected in 1983, approximately 0.4 mile (2110 feet) south of PCN-2 (0.55 mile from US 199). In 2010, the surveyors detected a single male at night in PCN-2, 675 feet south of US 199. The surveyors also obtained an unsolicited visual detection of an owl pair while camping at the southern edge of PCN-2. The spotted owl pair flew due south and the surveyors believed that the activity center was approximately 775 feet south from the visual detection near a small creek with the most suitable spotted owl habitat they had observed during their surveys. The pair was named the Dollar Bend pair because the original Cedar Rustic Campground pair had not been detected since 1983, and was likely no longer present. The 2010 Dollar Bend pair activity center is approximately 0.12 mile (630 feet) south of the PCN-2 portion of the action area and 0.28 mile (1478 feet) south of US 199.

Other than the Dollar Bend pair territory mentioned above, the closest known spotted owl territory is over 2 miles from the Narrows project location, and just less than 2 miles from the PCN-2 project location. However, no known spotted owl surveys have been conducted within suitable spotted owl habitat within the Narrows or in about one-half of the suitable habitat within the PCN-2. Therefore, accurate estimates of spotted owl abundance, distribution, and reproductive success throughout the entire action area are not available.

**EFFECTS OF THE ACTION**

This section presents an analysis of the direct and indirect effects of the proposed action on the spotted owl, together with the effects of other activities that are interrelated or interdependent with the proposed action. Interrelated actions are those that are part of the larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. These effects are evaluated along with the environmental baseline and the predicted cumulative effects to determine the overall effects to the species.

Road construction and bridge replacement activities have the potential to adversely affect spotted owls through habitat modification, disturbance, or direct injury or mortality. Road construction and bridge replacement activities could also adversely affect spotted owl critical habitat through removal of primary constituent elements. However, no critical habitat occurs in either action area.

### ***Likelihood of the Species' Presence***

One known spotted owl activity center (Dollar Bend pair) occurs in the PCN-2 portion of the action area. Although the 2010 Dollar Bend activity center location is actually located 625 feet from the southern edge of the PCN-2 portion of the action area, the pair was also detected in 2010 north of the activity center location just inside the action area. The extent to which the Dollar Bend pair uses suitable habitat located in approximately one-half of the PCN-2, including areas closer to actual construction activities, is unknown due to a lack of surveys in those areas. Although there are no data confirming the presence of spotted owls in the Narrows portion of the action area, this species may be present in the unsurveyed suitable habitat that occurs at that location.

### ***Scientific Basis for Evaluating Potential Effects on the Spotted Owl***

#### **Habitat Modification**

Habitat modification can directly or indirectly affect spotted owls at either site-specific or landscape scales. Loss or alteration of habitat characteristics, such as stand size, canopy closure, horizontal structure, snags, downed woody material, and others, may result in impacts to nesting spotted owls (Service 2011). The degree to which habitat modification affects habitat function for spotted owls is categorized as removal, downgrading, or maintenance. Removal results in the complete loss of suitable nesting\roosting or foraging habitat. For example, an area that functioned as nesting habitat before the action would no longer function as nesting habitat after the action. Downgrading refers to modifications that downgrade nesting\roosting habitat to foraging habitat. Maintenance involves modifications that still maintain the structural components that define suitable nesting\roosting or foraging habitat (*i.e.*, no downgrade from nesting\roosting to foraging or downgrade from foraging to dispersal). Any habitat modifications will be discussed in the following analysis of effects to spotted owls.

Generally, the Service considers actions that remove or downgrade suitable<sup>1</sup> spotted owl habitat to below 400 acres (162 hectares)—of which 250 acres (101 hectares) must be nesting and roosting habitat—within 0.5 mile (0.8 kilometer) of an activity center, or to below 1335 acres (540 hectares) of suitable habitat within 1.3 miles (2 kilometers) of an activity center, may result in take. Although maintenance refers to habitat modification that does not affect habitat function, large-scale habitat maintenance may result in significant impacts to habitat function for spotted owls.

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<sup>1</sup> "Suitable" spotted owl habitat is comprised of nesting, roosting and foraging habitats.

### Disturbance

Road construction and bridge replacement activities require the use of heavy equipment that introduces auditory and visual disturbances into the environment. The effects of auditory and visual disturbances on birds are extremely difficult to determine (Knight and Skagen 1988). Confounding factors include: the tolerance level of individual birds; type and frequency of human activity; ambient sound levels; how sound reacts with topography and vegetation; and differences in how species perceive noise and human presence. Regardless of these difficulties, research conducted on a variety of bird species suggests that the effects of human disturbance can have a negative impact on reproductive success (Carney and Sydeman 1999; Frid and Dill 2002; Marzluff and Neatherlin 2006). Disturbance can affect productivity in a number of ways, including interference of courtship (Bednarz and Hayden 1988), nest abandonment (White and Thurow 1985), egg and hatchling mortality, due to exposure and predation (Drent 1972; Swenson 1979), and altered parental care (Fyfe and Olendorff 1976; Bortolotti *et al.* 1984).

Auditory or visual disturbance from action-generated sound may reach the level of take for the spotted owl when at least one of the following conditions is met (Service 2006): (1) action-generated sound exceeds existing ambient sound levels by 20–25 decibels; (2) action-generated sound, when added to existing ambient sound levels, exceeds 90 decibels; or (3) proposed activities occur within the visual line-of-sight distance of 40 meters (130 feet) or less from a spotted owl nest. Disturbance during the spotted owl breeding season may potentially disrupt the species' essential breeding behaviors by: (1) causing abandonment of the breeding effort by failure to initiate nesting or to complete incubation; (2) disrupting nesting activity, such as feeding young; and (3) causing premature dispersal of juveniles.

In California, the Service has defined the spotted owl breeding season as the period from February 1 through August 1. However, by July 10 the majority of young owls have fledged from the nest. Therefore, after July 9 we would not expect auditory or visual disturbance to result in abandonment of the breeding effort, disruption of nesting activities, or premature dispersal of juveniles.

### Direct Injury or Mortality

Although very unlikely, road construction and bridge replacement activities could result in direct mortality of adult spotted owls, eggs, or chicks. For example, a potential exists for falling trees to strike and kill or injure a spotted owl. During tree felling individual adult birds can reasonably be expected to move from the area and thus should avoid injury or death. However, nesting adults may tenaciously continue reproductive activities, such as incubation or brooding of young, and may be reluctant to leave the area, and therefore are vulnerable to injury or death, when the tree they are in is felled or another tree strikes the tree they inhabit. Young-of-the-year in the nest may disperse prematurely in response to auditory or visual disturbance, and as a result be at higher risk of predation.

## *Effects of the Proposed Action on Spotted Owls*

### Habitat Modification

*The Narrows:* Forty-six trees will be removed at this project location. However, the area (north of US 199) from where the trees will be removed is not considered to be suitable spotted owl nesting/roosting/foraging habitat. Therefore, the proposed activities within this portion of the action area will not adversely affect suitable spotted owl habitat. The single Douglas-fir tree that is potentially suitable as a spotted owl nest tree will be removed outside the spotted owl nesting season to avoid taking nesting adult owls, eggs, or nestlings.

*PCN-2:* Tree removal at PCN-2 will result in the loss of approximately 0.2 acre of suitable spotted owl nesting/roosting habitat and an additional 0.5 acre of foraging habitat. The home range of the Dollar Bend pair had 1702 acres (689 hectares) of suitable NRF habitat prior to the proposed activities. Therefore, the removal of less than an acre of NRF habitat will maintain suitable habitat within the Dollar Bend home range well above the take threshold of 1335 acres. The two Douglas-fir trees that are potentially suitable as spotted owl nest trees will be removed outside the spotted owl nesting season to avoid taking nesting adult owls, eggs, or nestlings. All 108 trees that will be removed are within 100 feet of US 199 and thus unlikely to be used by spotted owls for nesting or roosting. Similarly, all foraging habitat that will be removed occurs immediately adjacent to US 199, and is probably not used by foraging spotted owls. Therefore, the proposed activities within this action area will adversely affect an extremely-small amount of suitable spotted owl habitat.

### Disturbance

#### *Auditory Disturbance*

The maximum action-generated sound at both the Narrows and PCN-2 will be from blasting (93 decibels). Caltrans will conduct blasting outside the spotted owl nesting season to avoid disturbance to nesting adults and dependent young. However, spotted owls foraging or roosting within either area outside the nesting season may be exposed to blasting noise, which exceeds the maximum ambient sound levels for US 199 by 30 decibels. However, blasting will be of very short duration, will occur only during a single construction season, and roosting or foraging owls are able to depart the area once blasting commences. Further, the estimated sound level for blasting was measured at 50 feet from the activity and will likely be attenuated to below 90 decibels prior to reaching spotted owl NRF habitat within the area. Finally, blasting will occur on steep, rocky slopes with little NRF habitat within 50 feet; therefore, the likelihood of blasting noise disturbing roosting or foraging spotted owls is low and is not likely to reach the level of take.

The remaining equipment and activities that will generate sound levels that significantly (by 20 or more decibels) exceed ambient sound levels for US 199 (including blasting) should be attenuated to ambient levels by 825 feet from the noise-generating equipment or activity. Spotted owls occurring within the 52 acres of suitable spotted owl nesting/roosting habitat and 7 acres of foraging habitat within 825 feet of US 199 at the Narrows will be exposed to these elevated

sound levels during a portion of the nesting season for two consecutive construction seasons. However, construction during both years will be conducted from June to October, which is near the end of the spotted owl nesting season, and will last for only 50 working days each year. Spotted owls occurring within the 69 acres of suitable spotted owl nesting/roosting habitat and 15 acres of foraging habitat within 825 feet of US 199 at PCN-2 will be exposed to these elevated sound levels during a portion of the nesting season for three consecutive construction seasons. However, construction during all three years will be conducted from June to October, which is near the end of the spotted owl nesting season, and will last for 100 working days each year. The Narrows and PCN-2 action areas are encompassed by the Dollar Bend home range and contain 143 acres of suitable spotted owl habitat that will be exposed to above-ambient sound levels, which represents only 8.4 percent of the 1702 acres of suitable habitat within the Dollar Bend home range. Therefore, there is a low likelihood that the Dollar Bend pair or dependent young will be disturbed to the level of take by action-generated sound during the nesting season.

#### *Visual Disturbance*

During the proposed action, human activity will only occur within 100 feet of US 199. Very little suitable spotted owl habitat occurs within 100 feet of US 199 at either the Narrows or PCN-2 project locations. Due to the proximity of the proposed action to US 199 and the small amount of suitable habitat that will be exposed to human activities, the probability that spotted owls will be disturbed to the level of take is very low.

#### *Direct Injury or Mortality*

The Service does not anticipate any direct injury or mortality of spotted owls due to construction activities. All tree removal within the PCN-2 portion of the action area will occur outside the spotted owl nesting season so the likelihood of a falling tree injuring or killing a nesting adult, eggs, or young is extremely low. Adults or fledged young that are roosting or foraging in the action area may be exposed to above ambient sound levels, but can vacate the area before experiencing adverse effects from the elevated sound levels.

### **CUMULATIVE EFFECTS**

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur within the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation with the Service pursuant to section 7 of the Act.

Caltrans conducts periodic maintenance activities on US 199, such as roadside mowing, repaving, bridge maintenance and improvement, and other safety-related activities. Although Caltrans is a state agency, they act as the lead Federal agency for road projects through an agreement with the Federal Highway Administration. Therefore, future Caltrans actions that are unrelated to the proposed action are not considered in this section because they too require separate consultation with the Service pursuant to section 7 of the Act. No additional state, tribal,

local, and private actions are known to be planned in the area that would result in a cumulative adverse impact to the spotted owl.

## CONCLUSION

After reviewing the current status of the spotted owl, the environmental baseline, the effects of the action, and the cumulative effects, it is the Service's biological opinion that the proposed action will not jeopardize the continued existence of the spotted owl. Critical habitat for this species has been designated. However, no critical habitat exists within the action area.

The Service reached the non-jeopardy conclusion based on the following factors:

1. A total of 0.2 acre (0.08 hectare) of nesting and roosting habitat, and 0.5 acre (0.2 hectare) of foraging habitat, in the action area will be removed at PCN-2. This constitutes an exceedingly small proportion (less than 0.00001 percent) of the estimated 7.4 million acres of suitable habitat within the range of the northern spotted owl. The Service does not anticipate any direct injury or mortality of spotted owls during the removal of suitable habitat at PCN-2.
2. The Dollar Bend spotted owl pair and their young, and other spotted owls that may occur within the estimated 143 acres of suitable habitat in the action area, may be subjected to auditory and visual disturbance during the proposed action. Only 8.4 percent of the 1702 acres of suitable habitat within the Dollar Bend home range will be exposed to above-ambient sound levels. Therefore, there is a low probability that the Dollar Bend pair or dependent young (and other spotted owls that may occur in the action area) will be disturbed to the level of take by the proposed action. The probability of spotted owls being affected by visual disturbance is extremely low, and thus, is not expected to result in take of spotted owls.
3. The conservation measures that will be implemented will minimize the potential for take of nesting adults and dependent young due to direct injury or mortality, or auditory and visual disturbance.

## INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the taking of endangered and threatened species, respectively, without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of

section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance the terms and conditions of this Incidental Take Statement.

#### **AMOUNT OR EXTENT OF TAKE**

No incidental take of northern spotted owls is expected as a result of implementation of the proposed action.

#### **EFFECT OF THE TAKE**

In the accompanying biological opinion, the Service determined that no take of spotted owls is anticipated; therefore the proposed action is not likely to result in jeopardy to the spotted owl.

#### **REASONABLE AND PRUDENT MEASURES**

No reasonable and prudent measures are necessary or appropriate provided Caltrans implements the conservation measures listed in the project description.

#### **TERMS AND CONDITIONS**

The Service has determined that no terms and conditions are required.

#### **MONITORING REQUIREMENTS**

The Service has determined that no monitoring requirements are necessary.

#### **REPORTING REQUIREMENTS**

The Service requests that Caltrans provide the Service and the acting wildlife biologist of the Smith River National Recreation Area, Six Rivers National Forest with results of pre-action surveys conducted to detect the current Dollar Bend pair territory activity center.

#### **COORDINATION OF INCIDENTAL TAKE WITH OTHER LAWS, REGULATIONS, AND POLICIES**

The incidental take statement provided in this biological opinion satisfies the requirements of the Act. The Service will not refer the incidental take of any migratory bird or bald eagle for prosecution under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. §§ 668–668d), if such take is in compliance with the terms and conditions, including the amount and/or number specified herein.

### CONSERVATION RECOMMENDATIONS

Sections 2(c) and 7(a)(1) of the Act direct Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species and the ecosystems upon which they depend. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

The Service has not identified any conservation recommendations for this consultation.

### REINITIATION NOTICE

This concludes formal consultation on the action. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may have affected listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat is designated that may be affected by the action.

This concludes formal consultation on this action. If you have any questions regarding this biological opinion, please contact Gregory Schmidt of my staff at (707) 822-7201.

Sincerely,



Nancy J. Finley  
Field Supervisor

cc:

USFS, Smith River National Recreation Area, Gasquet, California (Attn: Brenda Devlin)  
Caltrans (Attn: Gail Popham)  
CDFG (Attn: JoAnn Dunn)

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## APPENDIX A

## STATUS OF THE NORTHERN SPOTTED OWL

### Legal Status

The northern spotted owl was listed as threatened on June 26, 1990 due to widespread loss and adverse modification of suitable habitat across the owl's entire range and the inadequacy of existing regulatory mechanisms to conserve the northern spotted owl (55 FR 26114). On June 28, 2011, the Service completed a Revised Recovery Plan for the Northern Spotted Owl (*Strix occidentalis caurina*) (SERVICE 2011) which established criteria for recovery and eventual delisting. The current Service recovery priority number for the northern spotted owl is 12C (SERVICE 2011), on a scale of 1C (highest) to 18 (lowest). This number reflects a moderate degree of threat, a low potential for recovery, the northern spotted owl's taxonomic status as a subspecies and inherent conflicts with development, construction, or other economic activity given the economic value of older forest northern spotted owl habitat. A moderate degree of threat equates to a continual population decline and threat to its habitat, although extinction is not imminent. While the Service is optimistic regarding the potential for recovery, there is uncertainty regarding our ability to alleviate barred owl (*Strix varia*) impacts to northern spotted owls and the techniques are still experimental, which matches our guidelines' "low recovery potential" definition (48 FR 43098 and 48 FR 51985).

Critical habitat for the northern spotted owl was first designated in 1992 (57 FR 1796), and revised in 2008 (73 FR 47326). The 2008 critical habitat designation includes approximately 5,312,300 acres (2,149,800 hectares) of Federal lands in California, Oregon and Washington. On March 8, 2012, the Service proposed to revise critical habitat identifying approximately 13,962,449 acres (5,650,403 hectares) that meet the definition of critical habitat in 11 units and 63 subunits in California, Oregon, and Washington (77 FR 14062).

### Life History

#### *Taxonomy*

The northern spotted owl is one of three subspecies of spotted owls currently recognized by the American Ornithologists' Union. The taxonomic separation of these three subspecies is supported by genetic, (Barrowclough and Gutiérrez 1990; Barrowclough *et al.* 1999; Haig *et al.* 2004) morphological (Gutiérrez *et al.* 1995), and biogeographic information (Barrowclough and Gutiérrez 1990). The distribution of the Mexican subspecies (*S. o. lucida*) is separate from those of the northern and California (*S. o. occidentalis*) subspecies (Gutiérrez *et al.* 1995). Recent studies analyzing mitochondrial DNA sequences (Haig *et al.* 2004; Chi *et al.* 2004; Barrowclough *et al.* 2005) and microsatellites (Henke *et al.*, unpubl. data) confirmed the validity of the current subspecies designations for northern and California spotted owls. The narrow hybrid zone between these two subspecies, which is located in the southern Cascades and northern Sierra Nevada, appears to be stable (Barrowclough *et al.* 2005). Funk *et al.* (2008) tested the validity of the three current recognized subspecies of spotted owls and found them to be valid. Bi-directional hybridization and dispersal between northern spotted owls and California spotted owls centered in southern Oregon and northern California was discovered. In addition, they found introgression of Mexican spotted owls into the northernmost parts of the northern

spotted owl populations in Washington, indicating long-distance dispersal of Mexican spotted owls into the northern spotted owl range (Funk *et al.* 2008). Some hybridization of northern spotted owls with barred owls has been recorded (Hamer *et al.* 1994; Gutiérrez *et al.* 1995; Dark *et al.* 1998; Kelly 2001).

### ***Current and Historical Range***

The current range of the northern spotted owl extends from southwest British Columbia through the Cascade Mountains, coastal ranges, and intervening forested lands in Washington, Oregon, and California, as far south as Marin County (55 FR 26114). The range of the northern spotted owl has been partitioned into 12 physiographic provinces (see Figure 1) based on recognized landscape subdivisions exhibiting different physical and environmental features since 1990. The Revised Recovery Plan (Service 2011) adopts the physiographic provinces as recovery units with the exception of the Willamette Valley because it contains large amounts of non-habitat. These provinces are distributed across the species' range as follows:

- Four provinces in Washington: Eastern Washington Cascades, Olympic Peninsula, Western Washington Cascades, Western Washington Lowlands
- Five provinces in Oregon: Oregon Coast Range, Willamette Valley, Western Oregon Cascades, Eastern Oregon Cascades, Oregon Klamath
- Three provinces in California: California Coast, California Klamath, California Cascades

The northern spotted owl is extirpated or uncommon in certain areas such as southwestern Washington and British Columbia. Timber harvest activities have eliminated, reduced or fragmented northern spotted owl habitat sufficiently to decrease overall population densities across its range, particularly within the coastal provinces where habitat reduction has been concentrated (Service 2011). In the more fire-prone provinces habitat loss from wildfire and the effects of fire exclusion on vegetation change has further eliminated, reduced and fragmented habitat (Service 2011).

### ***Physical Description***

The northern spotted owl is a medium-sized owl and is the largest of the three subspecies of spotted owls (Gutiérrez 1996). It is approximately 46 to 48 centimeters (18 inches to 19 inches) long and the sexes are dimorphic, with males averaging about 13 percent smaller than females. The mean mass of 971 males taken during 1,108 captures was 580.4 grams (1.28 pounds) (out of a range 430.0 to 690.0 grams) (0.95 pound to 1.52 pounds), and the mean mass of 874 females taken during 1,016 captures was 664.5 grams (1.46 pounds) (out of a range 490.0 to 885.0 grams) (1.1 pounds to 1.95 pounds) (P. Loschl and E. Forsman, pers. comm. cited in Service 2008). The northern spotted owl is dark brown with a barred tail and white spots on its head and breast, and it has dark brown eyes surrounded by prominent facial disks. Four age classes can be distinguished on the basis of plumage characteristics (Moen *et al.* 1991). The northern spotted owl superficially resembles the barred owl, a species with which it occasionally hybridizes

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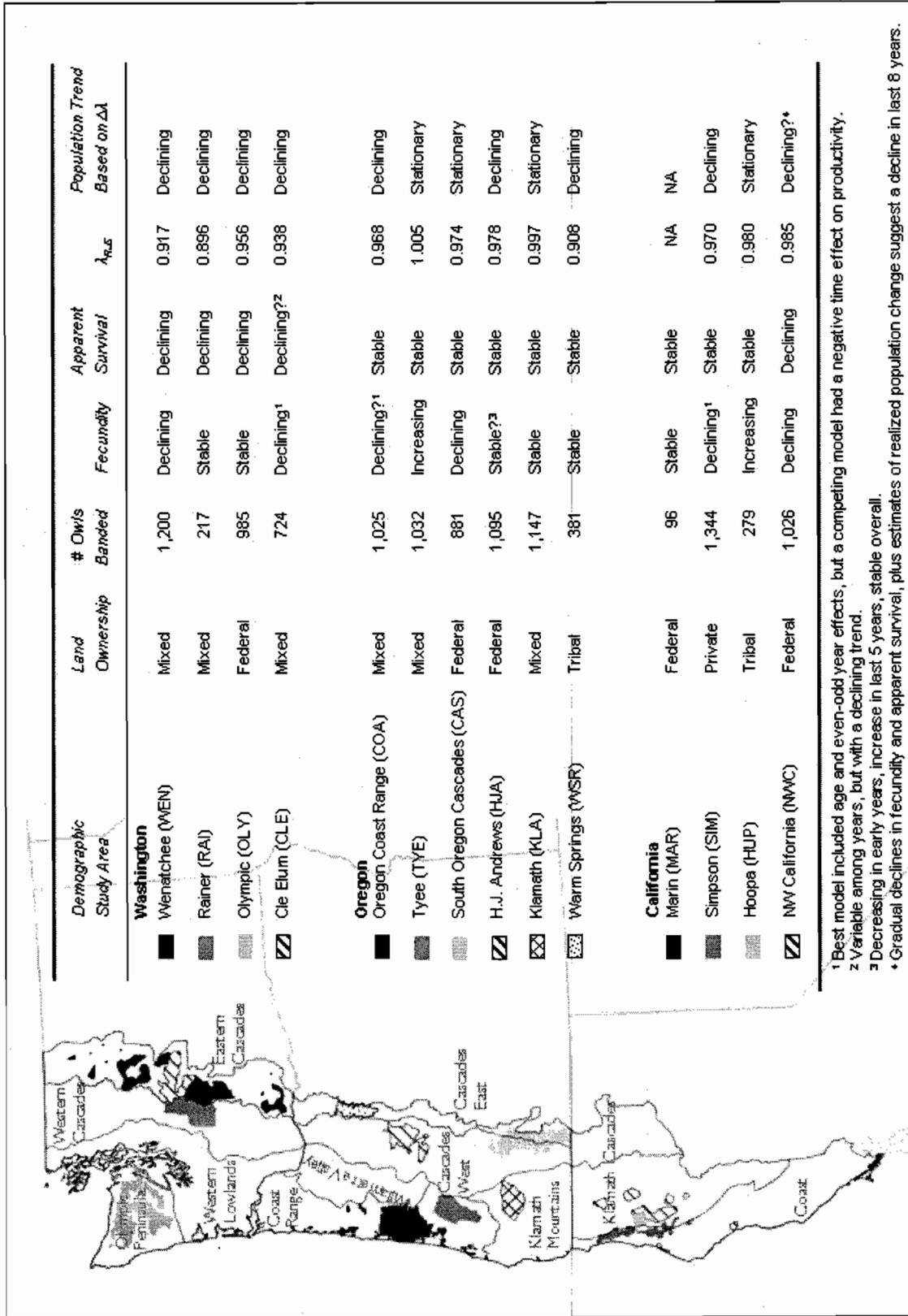


Figure 1. Physiographic provinces, northern spotted owl demographic study areas, and demographic trends (adapted from Anthony et al. 2006)

(Kelly and Forsman 2004). Hybrids exhibit physical and vocal characteristics of both species (Hamer *et al.* 1994).

## **Behavior**

### ***Locomotion***

Northern spotted owls spend virtually their entire lives beneath the forest canopy (Courtney *et al.* 2004). The species is adapted to shorter flights, maneuvering beneath the forest canopy rather than strong, sustained flight (Gutiérrez *et al.* 1995). Foraging is accomplished by moving from perch to perch through the forest, perching and waiting for prey activity and then pouncing on prey once it is located by sight or sound (Forsman 1976, 1980; Forsman *et al.* 1984; Gutiérrez *et al.* 1995).

### ***Roosting and Thermoregulation***

Northern spotted owls seek sheltered roosts to avoid inclement weather, summer heat, and predation (Forsman 1976, 1980; Barrows and Barrows 1978; Barrows 1981; Forsman *et al.* 1984; Ting 1998). During warm weather, northern spotted owls seek roosts in shady recesses of understory trees and occasionally will even roost on the ground (Barrows and Barrows 1978; Barrows 1981; Forsman *et al.* 1984; Gutiérrez *et al.* 1995). In winter, they roost relatively high near the bole of canopy trees with overhanging branches to shelter themselves from precipitation, or when sunny, will seek roosts with sun exposure (Sisco 1984).

### ***Daily Activity Pattern***

Northern spotted owls are primarily nocturnal (Forsman *et al.* 1984). They forage between dawn and dusk and sleep during the day with peak activity occurring during the two hours after sunset and the two hours prior to sunrise (Forsman *et al.* 1984; Gutiérrez *et al.* 1995; Delaney *et al.* 1999). They will sometimes take advantage of vulnerable prey near their roosts during the day (Laymon 1991; Sovern *et al.* 1994).

### ***Agonistic Behavior and Territoriality***

Northern spotted owls are territorial. They become alert when roosting whenever large birds fly over the canopy or when potential predators enter their nesting or roosting stands (Forsman 1976; Gutiérrez *et al.* 1995). They will actively defend their nests and young from predators (Forsman 1976; Gutiérrez *et al.* 1995). Northern spotted owls will regularly confront other spotted owls with aggressive vocal displays (Forsman 1976, 1980; Forsman *et al.* 1984; Gutiérrez *et al.* 1995; Franklin *et al.* 1996). However, home ranges of adjacent pairs overlap (Forsman *et al.* 1984; Solis and Gutiérrez 1990) suggesting that the area defended is smaller than the area used for foraging. It appears that they learn to recognize their neighbor's voices and respond to them much less vigorously (Fitton 1991; Waldo 2002). Territorial defense is primarily affected by hooting, barking, and whistle type calls. Some northern spotted owls are not territorial but either remain as residents within the territory of a pair or move among territories (Gutiérrez 1996). These birds are referred to as "floaters." Floaters have special significance in

northern spotted owl populations because they may buffer the territorial population from decline (Franklin 1992). Little is known about floaters other than that they exist and typically do not respond to calls as vigorously as territorial birds (Gutiérrez 1996).

### ***Reproductive Biology***

The northern spotted owl is relatively long-lived, has a long reproductive life span, invests significantly in parental care, and exhibits high adult survivorship relative to other North American owls (Gutiérrez *et al.* 1995). Northern spotted owls are sexually mature at 1 year of age, but rarely breed until they are 2 to 5 years of age (Miller *et al.* 1985; Franklin 1992; Forsman *et al.* 2002). Breeding females lay one to four eggs per clutch, with the average clutch size being two eggs; however, most northern spotted owl pairs do not nest every year, nor are nesting pairs successful every year (Forsman *et al.* 1984; Anthony *et al.* 2006), and renesting after a failed nesting attempt is rare (Gutiérrez 1996). The small clutch size, temporal variability in nesting success, and delayed onset of breeding all contribute to the relatively low fecundity of this species (Gutiérrez 1996).

Courtship behavior usually begins in February or March, and females typically lay eggs in late March or April. The timing of nesting and fledging varies with latitude and elevation (Forsman *et al.* 1984). After they leave the nest in late May or June, juvenile northern spotted owls depend on their parents until they are able to fly and hunt on their own. Parental care continues after fledging into September (Forsman *et al.* 1984). During the first few weeks after the young leave the nest, the adults often roost with them during the day. By late summer, the adults are rarely found roosting with their young and usually only visit the juveniles to feed them at night (Forsman *et al.* 1984). Telemetry and genetic studies indicate that close inbreeding between siblings or parents and their offspring is rare (Haig *et al.* 2001, Forsman *et al.* 2002). Hybridization of northern spotted owls with California spotted owls and barred owls has been confirmed through genetic research (Hamer *et al.* 1994; Gutiérrez *et al.* 1995; Dark *et al.* 1998; Kelly 2001; Funk *et al.* 2008).

### ***Dispersal Biology***

Natal dispersal of northern spotted owls typically occurs in September and October with a few individuals dispersing in November and December (Forsman *et al.* 2002). Natal dispersal occurs in stages, with juveniles settling in temporary home ranges between bouts of dispersal (Forsman *et al.* 2002; Miller *et al.* 1997). The median natal dispersal distance is about 10 miles for males and 15.5 miles for females (Forsman *et al.* 2002). Dispersing juvenile northern spotted owls experience high mortality rates, exceeding 70 percent in some studies (Miller 1989). Known or suspected causes of mortality during dispersal include starvation, predation, and accidents (Miller 1989; Forsman *et al.* 2002). Parasitic infection may contribute to these causes of mortality, but the relationship between parasite loads and survival is poorly understood (Hoberg *et al.* 1989; Gutiérrez 1989; Forsman *et al.* 2002). Successful dispersal of juvenile northern spotted owls may depend on their ability to locate unoccupied suitable habitat in close proximity to other occupied sites (LaHaye *et al.* 2001).

There is little evidence that small openings in forest habitat influence the dispersal of northern spotted owls, but large, non-forested valleys such as the Willamette Valley apparently are barriers to both natal and breeding dispersal (Forsman *et al.* 2002). The degree to which water bodies, such as the Columbia River and Puget Sound, function as barriers to dispersal is unclear, although radio telemetry data indicate that northern spotted owls move around large water bodies rather than cross them (Forsman *et al.* 2002). Analysis of the genetic structure of northern spotted owl populations suggests that gene flow may have been adequate between the Olympic Mountains and the Washington Cascades, and between the Olympic Mountains and the Oregon Coast Range (Haig *et al.* 2001).

Breeding dispersal occurs among a small proportion of adult northern spotted owls; these movements were more frequent among females and unmated individuals (Forsman *et al.* 2002). Breeding dispersal distances were shorter than natal dispersal distances and also are apparently random in direction (Forsman *et al.* 2002). In California spotted owls, a similar subspecies, the probability for dispersal was higher in younger owls, single owls, paired owls that lost mates, owls at low quality sites, and owls that failed to reproduce in the preceding year (Blakesley *et al.* 2006). Both males and females dispersed at near equal proportions and distances (Blakesley *et al.* 2006). In 72 percent of observed cases of dispersal, dispersal resulted in increased habitat quality (Blakesley *et al.* 2006).

### ***Food Habits***

Northern spotted owls are mostly nocturnal, although they also forage opportunistically during the day (Forsman *et al.* 1984; 2004; Sovern *et al.* 1994). The composition of the northern spotted owl's diet varies geographically and by forest type. Generally, flying squirrels (*Glaucomys sabrinus*) are the most prominent prey for northern spotted owls in Douglas-fir and western hemlock (*Tsuga heterophylla*) forests (Forsman *et al.* 1984) in Washington (Hamer *et al.* 2001) and Oregon, while dusky-footed wood rats (*Neotoma fuscipes*) are a major part of the diet in the Oregon Klamath, California Klamath, and California Coastal provinces (Forsman *et al.* 1984; 2004; Ward *et al.* 1998). Depending on location, other important prey include deer mice (*Peromyscus maniculatus*), tree voles (*Arborimus longicaudus*, *A. pomo*), red-backed voles (*Clethrionomys* spp.), gophers (*Thomomys* spp.), snowshoe hare (*Lepus americanus*), bushy-tailed wood rats (*Neotoma cinerea*), birds, and insects, although these species comprise a small portion of the northern spotted owl diet (Forsman *et al.* 1984, 2004; Ward *et al.* 1998; Hamer *et al.* 2001).

Other prey species such as the red tree vole (*Arborimus longicaudus*), red-backed voles (*Clethrionomys gapperi*), mice, rabbits and hares, birds, and insects) may be seasonally or locally important (reviewed by Courtney *et al.* 2004). For example, Rosenberg *et al.* (2003) showed a strong correlation between annual reproductive success of northern spotted owls (number of young per territory) and abundance of deer mice (*Peromyscus maniculatus*) ( $r^2 = 0.68$ ), despite the fact they only made up  $1.6 \pm 0.5$  percent of the biomass consumed. However, it is unclear if the causative factor behind this correlation was prey abundance or a synergistic response to weather (Rosenberg *et al.* 2003). Ward (1990) also noted that mice were more abundant in areas selected for foraging by owls. Nonetheless, northern spotted owls deliver larger prey to the nest and eat smaller food items to reduce foraging energy costs; therefore, the

importance of smaller prey items, like *Peromyscus*, in the northern spotted owl diet should not be underestimated (Forsman *et al.* 2001; 2004).

## **Habitat Relationships**

### ***Home Range***

Home-range sizes vary geographically, generally increasing from south to north, which is likely a response to differences in habitat quality (55 FR 26114). Estimates of median size of their annual home range (the area traversed by an individual or pair during their normal activities (Thomas and Raphael 1993) vary by province and range from 2,955 acres in the Oregon Cascades (Thomas *et al.* 1990) to 14,211 acres on the Olympic Peninsula (Service 1994a). Zabel *et al.* (1995) showed that these provincial home ranges are larger where flying squirrels are the predominant prey and smaller where wood rats are the predominant prey. Home ranges of adjacent pairs overlap (Forsman *et al.* 1984; Solis and Gutiérrez 1990), suggesting that the defended area is smaller than the area used for foraging. Within the home range there is a smaller area of concentrated use during the breeding season (~20 percent of the home range), often referred to as the core area (Bingham and Noon 1997). Northern spotted owl territories vary in size geographically and provide habitat elements that are important for the reproductive efficacy of the territory, such as the nest tree, roost sites and foraging areas (Bingham and Noon 1997). Northern spotted owls use smaller home ranges during the breeding season and often dramatically increase their home range size during fall and winter (Forsman *et al.* 1984; Sisco 1990).

Although differences exist in natural stand characteristics that influence home range size, habitat loss and forest fragmentation effectively reduce habitat quality in the home range. A reduction in the amount of suitable habitat reduces northern spotted owl nesting success (Bart 1995) and abundance (Bart and Forsman 1992).

### ***Habitat Use and Selection***

Forsman *et al.* (1984) reported that northern spotted owls have been observed in the following forest types: Douglas-fir (*Pseudotsuga menziesii*), western hemlock (*Tsuga heterophylla*), grand fir (*Abies grandis*), white fir (*Abies concolor*), ponderosa pine (*Pinus ponderosa*), Shasta red fir (*Abies magnifica shastensis*), mixed evergreen, mixed conifer hardwood (Klamath montane, Marin County, California), and redwood (*Sequoia sempervirens*). In addition, northern spotted owls in Marin County, California use Bishop pine forests and mixed evergreen-deciduous hardwood forests (Service 2011). The upper elevation limit at which northern spotted owls occur corresponds to the transition to subalpine forest, which is characterized by relatively simple structure and severe winter weather (Forsman 1976; Forsman *et al.* 1984).

Northern spotted owls generally rely on older forested habitats because such forests contain the structures and characteristics required for nesting, roosting, and foraging. Features that support nesting and roosting typically include a moderate to high canopy closure (60 to 90 percent); a multi-layered, multi-species canopy with large overstory trees (with diameter at breast height [dbh] of greater than 30 inches); a high incidence of large trees with various deformities (large

cavities, broken tops, mistletoe infections, and other evidence of decadence); large snags; large accumulations of fallen trees and other woody debris on the ground; and sufficient open space below the canopy for northern spotted owls to fly (Thomas *et al.* 1990). Nesting northern spotted owls consistently occupy stands with a high degree of canopy closure that may provide thermoregulatory benefits (Weathers *et al.* 2001) and protection from predators.

Northern spotted owls nest almost exclusively in trees. Like roosts, nest sites are found in forests having complex structure dominated by large diameter trees (Forsman *et al.* 1984; Hershey *et al.* 1998). Even in forests that have been previously logged, northern spotted owls select forests having a structure (*i.e.*, larger trees, greater canopy closure) different than forests generally available to them (Folliard 1993; Buchanan *et al.* 1995; Hershey *et al.* 1998).

Roost sites selected by northern spotted owls have more complex vegetation structure than forests generally available to them (Barrows and Barrows 1978; Forsman *et al.* 1984; Solis and Gutiérrez 1990). These habitats are usually multi-layered forests having high canopy closure and large diameter trees in the overstory.

Foraging habitat varies widely across the northern spotted owl's range (77 FR 14062). Descriptions of foraging habitat have ranged from complex structure (Solis and Gutiérrez 1990) to forests with lower canopy closure and smaller trees than forests containing nests or roosts (Gutiérrez 1996).

Foraging habitat for northern spotted owls provides a food supply for survival and reproduction. Foraging activity is positively associated with tree height diversity (North *et al.* 1999), canopy closure (Irwin *et al.* 2000; Courtney *et al.* 2004), snag volume, density of snags greater than 20 in (50 cm) dbh (North *et al.* 1999; Irwin *et al.* 2000; Courtney *et al.* 2004), density of trees greater than or equal to 31 in (80 cm) dbh (North *et al.* 1999), volume of woody debris (Irwin *et al.* 2000), and young forests with some structural characteristics of old forests (Carey *et al.* 1992; Irwin *et al.* 2000). Northern spotted owls select old forests for foraging in greater proportion than their availability at the landscape scale (Carey *et al.* 1992; Carey and Peeler 1995; Forsman *et al.* 2005), but will forage in younger stands with high prey densities and access to prey (Carey *et al.* 1992; Rosenberg and Anthony 1992; Thome *et al.* 1999).

Dispersal habitat is essential to maintaining stable populations by filling territorial vacancies when resident northern spotted owls die or leave their territories, and to providing adequate gene flow across the range of the species. Dispersal habitat, at a minimum, consists of stands with adequate tree size and canopy closure to provide protection from avian predators and at least minimal foraging opportunities. Dispersal habitat may include younger and less diverse forest stands than foraging habitat, such as even-aged, pole-sized stands, but such stands should contain some roosting structures and foraging habitat to allow for temporary resting and feeding for dispersing juveniles (77 FR 14062). Forsman *et al.* (2002) found that northern spotted owls could disperse through highly fragmented forest landscapes. However, the stand-level and landscape-level attributes of forests needed to facilitate successful dispersal have not been thoroughly evaluated (Buchanan 2004).

Northern spotted owls may be found in younger forest stands that have the structural characteristics of older forests or retained structural elements from the previous forest. In redwood forests and mixed conifer-hardwood forests along the coast of northwestern California, considerable numbers of northern spotted owls also occur in younger forest stands, particularly in areas where hardwoods provide a multi-layered structure at an early age (Thomas *et al.* 1990; Diller and Thome 1999). In mixed conifer forests in the eastern Cascades in Washington, 27 percent of nest sites were in old-growth forests, 57 percent were in the understory reinitiation phase of stand development, and 17 percent were in the stem exclusion phase (Buchanan *et al.* 1995). In the western Cascades of Oregon, 50 percent of northern spotted owl nests were in late-seral/old-growth stands (greater than 80 years old), and none were found in stands of less than 40 years old (Irwin *et al.* 2000).

In the Western Washington Cascades, northern spotted owls roosted in mature forests dominated by trees greater than 50 centimeters (19.7 inches) dbh with greater than 60 percent canopy closure more often than expected for roosting during the non-breeding season. Northern spotted owls also used young forest (trees of 20 to 50 centimeters (7.9 inches to 19.7 inches) dbh with greater than 60 percent canopy closure) less often than expected based on this habitat's availability (Herter *et al.* 2002).

In the Coast Ranges, Western Oregon Cascades and the Olympic Peninsula, radio-marked northern spotted owls selected for old-growth and mature forests for foraging and roosting and used young forests less than predicted based on availability (Forsman *et al.* 1984; Carey *et al.* 1990; Forsman *et al.* 2005). Glenn *et al.* (2004) studied northern spotted owls in young forests in western Oregon and found little preference among age classes of young forest.

Habitat use is influenced by prey availability. Ward (1990) found that northern spotted owls foraged in areas with lower variance in prey densities (that is, where the occurrence of prey was more predictable) within older forests and near ecotones of old forest and brush seral stages. Zabel *et al.* (1995) showed that northern spotted owl home ranges are larger where flying squirrels (*Glaucomys sabrinus*) are the predominant prey and smaller where wood rats (*Neotoma* spp.) are the predominant prey.

Recent landscape-level analyses in portions of Oregon Coast and California Klamath provinces suggest that a mosaic of late-successional habitat interspersed with other seral conditions may benefit northern spotted owls more than large, homogeneous expanses of older forests (Zabel *et al.* 2003; Franklin *et al.* 2000; Meyer *et al.* 1998). In Oregon Klamath and Western Oregon Cascade provinces, Dugger *et al.* (2005) found that apparent survival and reproduction was positively associated with the proportion of older forest near the territory center (within 730 meters) (2,395 feet). Survival decreased dramatically when the amount of non-habitat (non-forest areas, sapling stands, etc.) exceeded approximately 50 percent of the home range (Dugger *et al.* 2005). The authors concluded that they found no support for either a positive or negative direct effect of intermediate-aged forest—that is, all forest stages between sapling and mature, with total canopy cover greater than 40 percent—on either the survival or reproduction of northern spotted owls. It is unknown how these results were affected by the low habitat fitness potential in their study area, which Dugger *et al.* (2005) stated was generally much lower than those in Franklin *et al.* (2000) and Olson *et al.* (2004), and the low reproductive rate and survival in their

study area, which they reported were generally lower than those studied by Anthony *et al.* (2006). Olson *et al.* (2004) found that reproductive rates fluctuated biennially and were positively related to the amount of edge between late-seral and mid-seral forests and other habitat classes in the central Oregon Coast Range. Olson *et al.* (2004) concluded that their results indicate that while mid-seral and late-seral forests are important to northern spotted owls, a mixture of these forest types with younger forest and non-forest may be best for northern spotted owl survival and reproduction in their study area.

In order to capture the variability of habitat types used by northern spotted owls, the Service includes descriptions of nesting, roosting, foraging, and dispersal habitat by ecological zone in the proposed revision of critical habitat (77 FR 14062).

### **Population Dynamics**

The northern spotted owl is relatively long-lived, has a long reproductive life span, invests significantly in parental care, and exhibits high adult survivorship relative to other North American owls (Gutiérrez 1996). The northern spotted owl's long reproductive life span allows for some eventual recruitment of offspring, even if recruitment does not occur each year (Franklin *et al.* 2000).

Annual variation in population parameters for northern spotted owls has been linked to environmental influences at various life history stages (Franklin *et al.* 2000). In coniferous forests, mean fledgling production of the California spotted owl, a closely related subspecies, was higher when minimum spring temperatures were higher (North *et al.* 2000), a relationship that may be a function of increased prey availability. Across their range, northern spotted owls have previously shown an unexplained pattern of alternating years of high and low reproduction, with highest reproduction occurring during even-numbered years (e.g., Franklin *et al.* 1999). Annual variation in breeding may be related to weather (*i.e.*, temperature and precipitation) (Wagner *et al.* 1996 and Zabel *et al.* 1996 *In:* Forsman *et al.* 1996) and fluctuation in prey abundance (Zabel *et al.* 1996).

A variety of factors may regulate northern spotted owl population levels. These factors may be density-dependent (e.g., habitat quality, habitat abundance) or density-independent (e.g., climate). Interactions may occur among factors. For example, as habitat quality decreases, density-independent factors may have more influence on survival and reproduction, which tends to increase variation in the rate of growth (Franklin *et al.* 2000). Specifically, weather could have increased negative effects on northern spotted owl fitness for those owls occurring in relatively lower quality habitat (Franklin *et al.* 2000). A consequence of this pattern is that at some point, lower habitat quality may cause the population to be unregulated (have negative growth) and decline to extinction (Franklin *et al.* 2000).

Olson *et al.* (2005) used open population modeling of site occupancy that incorporated imperfect and variable detectability of northern spotted owls and allowed modeling of temporal variation in site occupancy, extinction, and colonization probabilities (at the site scale). The authors found that visit detection probabilities average less than 0.70 and were highly variable among study years and among their three study areas in Oregon. Pair site occupancy probabilities declined

greatly on one study area and slightly on the other two areas. However, for all owls, including singles and pairs, site occupancy was mostly stable through time. Barred owl presence had a negative effect on these parameters (see barred owl discussion in the New Threats section below). However, there was enough temporal and spatial variability in detection rates to indicate that more visits would be needed in some years and in some areas, especially if establishing pair occupancy was the primary goal.

## **Threats**

### ***Reasons for Listing***

The northern spotted owl was listed as threatened throughout its range “due to loss and adverse modification of suitable habitat as a result of timber harvesting and exacerbated by catastrophic events such as fire, volcanic eruption, and wind storms” (55 FR 26114). More specifically, threats to the northern spotted owl included low populations, declining populations, limited habitat, declining habitat, inadequate distribution of habitat or populations, isolation of provinces, predation and competition, lack of coordinated conservation measures, and vulnerability to natural disturbance (Service 1992). These threats were characterized for each province as severe, moderate, low or unknown (Service 1992) (The range of the northern spotted owl is divided into 12 provinces from Canada to northern California and from the Pacific Coast to the eastern Cascades; see Figure 1). Declining habitat was recognized as a severe or moderate threat to the northern spotted owl throughout its range, isolation of populations was identified as a severe or moderate threat in 11 provinces, and a decline in population was a severe or moderate threat in 10 provinces. Together, these three factors represented the greatest concerns about range-wide conservation of the northern spotted owl. Limited habitat was considered a severe or moderate threat in nine provinces, and low populations were a severe or moderate concern in eight provinces, suggesting that these factors were also a concern throughout the majority of the northern spotted owl’s range. Vulnerability to natural disturbances was rated as low in five provinces.

The degree to which predation and competition might pose a threat to the northern spotted owl was unknown in more provinces than any of the other threats, indicating a need for additional information. Few empirical studies exist to confirm that habitat fragmentation contributes to increased levels of predation on northern spotted owls (Courtney *et al.* 2004). However, great horned owls (*Bubo virginianus*), an effective predator on northern spotted owls, are closely associated with fragmented forests, openings, and clearcuts (Johnson 1992; Laidig and Dobkin 1995). As mature forests are harvested, great horned owls may colonize fragmented forests, thereby increasing northern spotted owl vulnerability to predation.

### ***Current Threats***

The Service conducted a 5-year review of the northern spotted owl in 2004 (Service 2004), for which we prepared a scientific evaluation of the status of the northern spotted owl. An analysis was conducted assessing how the threats described in 1990 might have changed by 2004 (Courtney *et al.* 2004). Some of the key threats identified in 2004 were past and current timber harvest, catastrophic wildfire, and barred owls. In the 2008 Final Recovery Plan for the Northern Spotted Owl (Service 2008), we identified habitat loss and barred owls as the two main factors limiting the ability of northern spotted owls to recover. And finally, the 2011 Revised Recovery Plan for the Northern Spotted Owl reiterates that past and current habitat loss from timber harvest and wildfire, and competition from barred owls are the most pressing threats to northern spotted owl recovery (Service 2011).

### ***Barred Owls***

It is the Service's position that the threat from barred owls is extremely pressing and complex, requiring immediate consideration. Addressing the threats associated with past and current habitat loss must be conducted simultaneously with addressing the threats from barred owls (Service 2011). With its recent expansion to as far south as Marin County, California along the Coast Range and Kings Canyon National Park in the southern Sierra Nevada (Gutiérrez *et al.* 2004; Steger *et al.* 2006), the barred owl's range now completely overlaps that of the northern spotted owl. Barred owls are likely competing with northern spotted owls for prey (Hamer *et al.* 2001, 2007; Gutiérrez *et al.* 2007; Livezey and Fleming 2007) or habitat (Hamer *et al.* 1989; Dunbar *et al.* 1991; Herter and Hicks 2000; Pearson and Livezey 2003, Singleton *et al.* 2010). In addition, barred owls have been observed physically attacking northern spotted owls (Pearson and Livezey 2003), and circumstantial evidence strongly indicated that a barred owl killed a northern spotted owl (Leskiw and Gutiérrez 1998). Evidence that barred owls are causing negative effects on northern spotted owls is largely indirect, based primarily on retrospective examination of long-term data collected on northern spotted owls (Kelly *et al.* 2003; Pearson and Livezey 2003; Olson *et al.* 2005). Because there has been no research to quantitatively evaluate the strength of different types of competitive interactions, such as resource partitioning and competitive interference, the particular mechanism by which the two owl species may be competing is unknown.

The only study comparing northern spotted owl and barred owl food habits in the Pacific Northwest indicated that barred owl diets overlap strongly (76 percent) with northern spotted owl diets (Hamer *et al.* 2001, 2007). Barred owl diets are more diverse than northern spotted owl diets and include species associated with riparian and other moist habitats (e.g. fish, invertebrates, frogs, and crayfish), along with more terrestrial and diurnal species (Smith *et al.* 1983; Mazur and James 2000; Hamer *et al.* 2001, 2007; Gronau 2005). Because barred owls take a much lower proportion of the four primary prey species taken by northern spotted owls (Hamer *et al.* 2001, 2007), barred owls may only be opportunistically taking northern spotted owl prey and not necessarily selecting for the same prey species (Gutiérrez *et al.* 2007). Even though barred owls may be taking northern spotted owls' primary prey only as a generalist, northern spotted owls may be affected by a sufficient reduction in the density of these prey items due to barred owls, leading to a depletion of prey to the extent that the northern spotted owl cannot find

an adequate amount of food to sustain maintenance or reproduction (Gutiérrez *et al.* 2007; Livezey and Fleming 2007).

Barred owls were initially thought to be more closely associated with early successional forests than northern spotted owls, based on studies conducted on the west slope of the Cascades in Washington (Hamer *et al.* 1989; Iverson 1993). However, recent studies conducted in the Pacific Northwest show that barred owls frequently use mature and old-growth forests (Hamer *et al.* 2001, 2007; Pearson and Livezey 2003; Schmidt 2006; Singleton *et al.* 2010), leading to habitat competition with northern spotted owls. In the fire prone forests of eastern Washington, a telemetry study conducted on barred owls showed that barred owl home ranges were located on lower slopes or valley bottoms, in closed canopy, mature, Douglas-fir forest, while northern spotted owl sites were located on mid-elevation areas with southern or western exposure, characterized by closed canopy, mature, ponderosa pine or Douglas-fir forest (Singleton *et al.* 2005). More recently, Singleton *et al.* (2010) found that barred owls preferred multispecies, structurally diverse forests with high canopy closure dominated by large overstory trees similar to northern spotted owls, however, barred owls also showed a preference for lower topographical areas and gentler slopes not usually preferred by northern spotted owls. Additionally, the two species use the same types of nests (Devereux and Mosher 1984; Forsman *et al.* 1984; Hamer 1988; Postupalsky *et al.* 1997). Although there are no estimates for home range sizes of barred owls in Oregon or California (Gutiérrez *et al.* 2007), northern spotted owl home ranges in Washington can be up to eight times larger than those of barred owls (Singleton *et al.* 2010).

The presence of barred owls has been reported to reduce northern spotted owl site occupancy, reproduction, and survival. The occupancy of historical territories by northern spotted owls in Washington and Oregon was significantly lower ( $p < 0.001$ ) after barred owls were detected within 0.8 kilometer (0.5 miles) of the territory center but was “only marginally lower” ( $p = 0.06$ ) if barred owls were located more than 0.8 kilometer (0.5 miles) from the northern spotted owl territory center (Kelly *et al.* 2003). Pearson and Livezey (2003) found that there were significantly more barred owl site-centers in unoccupied northern spotted owl circles than occupied northern spotted owl circles (centered on historical northern spotted owl site-centers) with radii of 0.8 kilometer (0.5 miles) ( $p = 0.001$ ), 1.6 kilometer (1 mile) ( $p = 0.049$ ), and 2.9 kilometer (1.8 miles) ( $p = 0.005$ ) in Gifford Pinchot National Forest. In Olympic National Park, Gremel (2005) found a significant decline ( $p = 0.01$ ) in northern spotted owl pair occupancy at sites where barred owls had been detected, while pair occupancy remained stable at northern spotted owl sites without barred owls. Olson *et al.* (2005) found that the annual probability that a northern spotted owl territory would be occupied by a pair of northern spotted owls after barred owls were detected at the site declined by 5 percent in the HJ Andrews study area, 12 percent in the Coast Range study area, and 15 percent in the Tyee study area. In contrast, Bailey *et al.* (2009), when using a two-species occupancy model, showed no evidence that barred owls excluded northern spotted owls from territories in Oregon. Most recently, preliminary results from a barred owl and northern spotted owl radio-telemetry study in Washington reported two northern spotted owls fleeing their territories and traveling six and 15 miles, believed to be as a result of frequent direct encounters with barred owls (Irwin *et al.* 2010). Both northern spotted owls were subsequently found dead (Irwin *et al.* 2010).

Olson *et al.* (2004) found that the presence of barred owls had a significant negative effect on the reproduction of northern spotted owls in the central Coast Range of Oregon (in the Roseburg study area). The conclusion that barred owls had no significant effect on the reproduction of northern spotted owls in one study (Iverson 2004) was unfounded because of small sample sizes (Livezey 2005). It is likely that all of the above analyses underestimated the effects of barred owls on the reproduction of northern spotted owls because northern spotted owls often cannot be relocated after they are displaced by barred owls (E. Forsman, pers. comm., cited in Service 2008). Anthony *et al.* (2006) found significant evidence for negative effects of barred owls on apparent survival of northern spotted owls in two of 14 study areas (Olympic and Wenatchee). They attributed the equivocal results for most of their study areas to the coarse nature of their barred owl covariate.

Barred owls and northern spotted owls occasionally hybridize and produce fertile young (Hamer *et al.* 1994; Kelly and Forsman 2004), although it is relatively uncommon (Gutiérrez *et al.* 2007). An analysis of more than 9,000 banded northern spotted owls throughout their range, revealed only 47 hybrids (Kelly and Forsman 2004). Hybridization with the barred owl is considered to be “an interesting biological phenomenon that is probably inconsequential, compared with the real threat—direct competition between the two species for food and space” (Kelly and Forsman 2004).

Monitoring and management of northern spotted owls has become more complicated due to a reduction in detectability when barred owls are present (Kelly *et al.* 2003; Courtney *et al.* 2004; Olson *et al.* 2005; Crozier *et al.* 2006). Olson *et al.* (2005) found that the presence of barred owls had a significant negative effect on the detectability of northern spotted owls, and that the magnitude of this effect did not vary among years. In a study simulating presence of barred owls, Crozier *et al.* (2006) determined that the presence of barred owls also might negatively affect responsiveness of northern spotted owls. Both northern spotted owls and California spotted owls responded less frequently in areas having high numbers of barred owls (Crozier *et al.* 2006). Lower response and calling of northern spotted owls could interfere with their ability to establish and defend territories. Evidence that northern spotted owls were responding less frequently during surveys led the Service and its many research partners to update the northern spotted owl survey protocol.

In areas where population sizes are extremely small, barred owls may pose an even larger threat. In British Columbia, Canada, relocation of barred owls has proven unsuccessful when one barred owl that was relocated 100 km across three mountain ranges returned to the same location in which it was captured within one year (Pynn 2010). Biologists eventually lethally controlled 12 barred owls that represented competition to the remaining six northern spotted owls occurring in the wild after these relocation efforts were unsuccessful (Pynn 2010).

Evidence suggests that barred owls are exacerbating the northern spotted owl population decline, particularly in Washington, portions of Oregon, and the northern coast of California (Dark *et al.* 1998; Gutiérrez *et al.* 2004, 2007; Courtney *et al.* 2004; Olson *et al.* 2005). There is no evidence that the increasing trend in barred owls has stabilized in any portion of the northern spotted owl's range in the western United States, and “there are no grounds for optimistic views suggesting

that barred owl impacts on northern spotted owls have been already fully realized” (Gutiérrez *et al.* 2004).

### ***Wildfire***

Studies indicate that the effects of wildfire on northern spotted owls and their habitat are variable, depending on fire intensity, severity and size. Within the fire-adapted forests of the northern spotted owl’s range, northern spotted owls likely have adapted to withstand fires of variable sizes and severities. However, fire is often considered a primary threat to spotted owls because of its potential to rapidly alter habitat (Bond *et al.* 2009) and is a major cause of habitat loss on Federal lands (Courtney *et al.* 2004).

Bond *et al.* (2002) examined the demography of the three spotted owl subspecies after wildfires, in which wildfire burned through spotted owl nest and roost sites in varying degrees of severity. Post-fire demography parameters for the three subspecies were similar or better than long-term demographic parameters for each of the three subspecies in those same areas (Bond *et al.* 2002). In a preliminary study conducted by Anthony and Andrews (2004) in the Oregon Klamath Province, their sample of northern spotted owls appeared to be using a variety of habitats within the area of the Timbered Rock fire, including areas where burning had been moderate.

At the time of listing there was recognition that large-scale wildfire posed a threat to the northern spotted owl and its habitat (55 FR 26114). It has been estimated that the rate of habitat loss due to stand-replacing fire within Federal lands managed under the Northwest Forest Plan (NWFP) was almost 140,000 acres between 1993 and 2004 (Moeur *et al.* 2005). Up until 2005, the overall total amount of habitat loss from wildfires was relatively small, estimated at approximately 1.2 percent on Federal lands (Lint 2005), but this estimation does not take into account habitat lost during the more recent large fires in 2007, 2008, and 2009.

Northern spotted owls may be resilient to the effects of wildfire—a process with which they have evolved. Hanson *et al.* (2009) believes northern spotted owls are actually suffering adverse consequences from a deficit of fire, which creates habitat necessary for an abundance of their key prey species. More research is needed to further understand the relationship between fire and northern spotted owl habitat use.

### ***West Nile Virus***

West Nile Virus (WNV), caused by a virus in the family Flaviviridae, has killed millions of wild birds in North America since it arrived in 1999 (Caffrey and Peterson 2003; Marra *et al.* 2004). Mosquitoes are the primary carriers (vectors) of the virus that causes encephalitis in humans, horses, and birds. Mammalian prey may also play a role in spreading WNV among predators, like northern spotted owls. West Nile virus has caused high levels of mortality in North American hawks and owls (Hull *et al.* 2010). Owls and other predators of mice can contract the disease by eating infected prey (Garmendia *et al.* 2000; Komar *et al.* 2003), and possibly through feces (Kipp *et al.* 2006). One captive northern spotted owl in Ontario, Canada, is known to have contracted WNV and died (Gancz *et al.* 2004), but there are no documented cases of the virus in wild spotted owls. During a four year study to detect antibody response of California spotted

owls, northern goshawk (*Accipiter gentilis*), and great gray owl (*Strix nebulosa*) in the Sierra Nevada mountains, no antibody response to WNV was found even though 10–60 percent of the species' populations were sampled (Hull *et al.* 2010). This finding is attributed to either low exposure of WNV to these species' in the study area or high mortality rates of the species to WNV (Hull *et al.* 2010).

Health officials expect that WNV eventually will spread throughout the range of the northern spotted owl (Blakesley *et al.* 2004), but it is unknown how the virus will ultimately affect northern spotted owl populations. Susceptibility to infection and the mortality rates of infected individuals vary among bird species (Blakesley *et al.* 2004), but most owls appear to be quite susceptible. For example, eastern screech-owls breeding in Ohio that were exposed to WNV experienced 100 percent mortality (T. Grubb pers. comm. in Blakesley *et al.* 2004). In California, 23.1 percent of western screech owls (*Otus kennicottii*) randomly collected dead by the public, tested positive for WNV, while 12.5 percent of great horned owls (*Bubo virginianus*) tested positive for WNV (Wheeler *et al.* 2009). Barred owls, in contrast, showed lower susceptibility (B. Hunter pers. comm. in Blakesley *et al.* 2004).

Blakesley *et al.* (2004) offer two possible scenarios for the likely outcome of northern spotted owl populations being infected by WNV. One scenario is that a range-wide reduction in northern spotted owl population viability is unlikely because the risk of contracting WNV varies between regions. An alternative scenario is that WNV will cause unsustainable mortality, due to the frequency and/or magnitude of infection, thereby resulting in long-term population declines and extirpation from parts of the northern spotted owl's current range. The WNV remains a potential threat of uncertain magnitude and effect (Blakesley *et al.* 2004). The Revised Recovery Plan recommends monitoring for WNV (Service 2011).

### ***Sudden Oak Death***

Sudden oak death was identified as a potential threat to the northern spotted owl by Courtney and Gutierrez (2004) and in the Revised Recovery Plan (USDI FWS2011). This disease is caused by the fungus-like pathogen, *Phytophthora ramorum* that was recently introduced from Europe and is rapidly spreading. The disease is now known to extend over 650 km from south of Big Sur, California to Curry County, Oregon (Rizzo and Garbelotto 2003), and has reached epidemic proportions in oak (*Quercus* spp.) and tanoak (*Lithocarpus densiflorus*) forests along approximately 300 km of the central and northern California coast (Rizzo *et al.* 2002). It has also been found near Brookings, Oregon, killing tanoak and causing dieback of closely associated wild rhododendron (*Rhododendron* spp.) and evergreen huckleberry (*Vaccinium ovatum*) (Goheen *et al.* 2002). It has been found in several different forest types and at elevations from sea level to over 800 m. Sudden oak death poses a threat of uncertain proportion because of its potential impact on forest dynamics and alteration of key prey and northern spotted owl habitat components (e.g., hardwood trees - canopy closure and nest tree mortality); especially in the southern portion of the northern spotted owl's range (Courtney and Gutierrez 2004). The Revised Recovery Plan recommends monitoring for sudden oak death (Service 2011).

### ***Inbreeding Depression, Genetic Isolation, and Reduced Genetic Diversity***

Inbreeding and other genetic problems due to small population sizes were not considered an imminent threat to the northern spotted owl at the time of listing. Recent studies show no indication of significantly reduced genetic variation in Washington, Oregon, or California (Barrowclough *et al.* 1999; Haig *et al.* 2001). Canadian populations may be more adversely affected by issues related to small population size including inbreeding depression, genetic isolation, and reduced genetic diversity (Courtney *et al.* 2004). In 2004, the breeding population was estimated to be less than 33 pairs and annual population decline may be as high as 35 percent (Harestad *et al.* 2004). Low and persistently declining populations throughout the northern portion of the species range (see "Population Trends" below) may be at increased risk of losing genetic diversity.

### ***Climate change***

The International Panel on Climate Change (IPCC), a scientific intergovernmental body established by the World Meteorological Organization and the United Nations Environment Programme to assess scientific information and consequences of climate change, concluded that climate change is occurring and is caused by human activities (Forster *et al.* 2007). The global average temperature has risen approximately 0.6 degrees centigrade during the 20<sup>th</sup> Century. Within this time, the Pacific Northwest has seen annual average temperature increases of 0.6 to 1.7 °C (Parson *et al.* 2000). Snow-season length and depth of snowpack are very likely to decrease in most of North America (Christenson *et al.* 2007), and has already been shown in several studies (Mote *et al.* 2005 and Regonda *et al.* 2005 cited in Vicuna and Dracup 2007; Trenberth *et al.* 2007). Snowmelt-driven runoff is predicted to occur as much as two months earlier in the western United States (Rauscher *et al.* 2008).

California, in particular, will suffer significant consequences as a result of climate change (California Climate Action Team 2006). Climate change is already affecting wildlife throughout California (Parmesan and Galbraith 2004), and its effects will continue to increase. Depending on the model and assumptions, scientists project the average annual temperature in California to rise between 4 and 10.5 degrees above the current average temperature by the end of the century (Schneider and Kuntz-Duriseti 2002; Turman 2002; Hayhoe *et al.* 2004). The Grinnell Resurvey Project in Yosemite National Park and surrounding areas have already recorded a substantial increase in monthly minimum temperatures of more than 3 degrees Celsius over 100 years, which is much greater than the average for the state of California (Moritz 2007). This temperature increase is also reflected in tree ring data and analyses of vegetation change (Millar *et al.* 2004). Seventeen species monitored in the Grinnell Resurvey Project showed range contractions (Moritz 2007). Most of these range contractions involved mid to high elevation taxa (Moritz 2007), coupled with the upward elevation movement of formerly low-elevation species (Moritz *et al.* 2008).

Climate change, a potential additional threat to northern spotted owl populations, is not explicitly addressed in the NWFP, and specific impacts from climate change to the species are not documented. Here we discuss the potential for direct and indirect impacts to northern spotted owls and their habitat focusing on drought, insects and disease, and wildfire (Service 2011).

Based upon a global meta-analysis, Parmesan and Yohe (2003) discussed several potential implications of global climate change to biological systems, including terrestrial flora and fauna. Results indicated that 62 percent of species exhibited trends indicative of advancement of spring conditions. In bird species, trends were manifested in earlier nesting activities. Because the northern spotted owl exhibits a limited tolerance to heat relative to other bird species (Weathers *et al.* 2001), subtle changes in climate have the potential for significant negative effects. Drought and hot weather can lead to poor northern spotted owl recruitment and survival during the summer resulting from changes in the availability of prey. Similarly, northern spotted owl reproduction, survival, and recruitment is negatively affected by wet, cold weather during the early nesting season (Franklin *et al.* 2000).

Climate change is expected to make unpredictable changes to many species' habitat. Changes in water availability to plants may affect tree growth and distribution of flora (Skinner 2007). Added stress, such as drought, to tree species and changes in the distribution of diseases and insects may make them more vulnerable, and may compound the susceptibility to high severity fire (Skinner 2007). The recent expansion of the mountain pine beetle (*Dendroctonus ponderosae* Hopkins) is an example of range expansion of insects that are affecting large amounts of North American forests (Skinner 2007). The dramatic increase in tree mortality due to these insects increases the potential for intense fires (Skinner 2007).

Changes in the fire regime are expected to occur due to warmer temperatures increasing the probability of severe fire and length of fire season (Skinner 2007). Westerling *et al.* (2006) showed that large wildfire activity has increased suddenly since mid-1980's, with higher large-wildfire frequency, longer wildfire duration and seasons. A greater number of fires with more fires escaping initial attack suppression are expected (Fried *et al.* 2004). However, Hanson *et al.* and others (2009) believe northern spotted owls are actually suffering adverse consequences from a deficit of fire, which creates habitat necessary for an abundance of their key prey species. Of all burn severity categories, Bond *et al.* (2009) found that California spotted owls mostly foraged in high-severity burned forest, actually avoiding unburned forest within one kilometer of the center of their foraging areas.

As shown by paleoecological record, dramatic changes in species distributions can take place over only a few decades to a century during periods of rapid climate variation (Peteet 2000; Davis and Shaw 2001). Current communities of plants are likely to dissolve and create new associations as species ranges adjust (Davis 1986; Whitlock 1992). The current assemblages are managed for favorable conditions for the northern spotted owl, however, the influence of a warming climate may make it more difficult to sustain appropriate habitat without considering climate (Skinner 2007). Winter precipitation was the most important climate variable based on northern spotted owl distribution models used by Carroll (2010), further suggesting that negative effects on survival and recruitment may occur due to climate change. Range shifts due to climate change may affect the effectiveness of reserves for northern spotted owls, increasing the importance of higher elevation reserves that were created before the NWFP (Carroll 2010).

Data from weather stations administered at Mendocino National Forest Ranger Stations have shown increases in mean annual temperature of 1 °C or less over the last 75 years, and

additionally two of these stations have shown highly significant increases in mean minimum (*i.e.* nighttime) temperatures of 1–2 °F (Butz and Safford 2011). Significant increases in nighttime temperatures have also been observed at several stations on the Klamath, Shasta-Trinity, and Six Rivers National Forests (Butz and Safford 2011). Results of demography studies in Oregon and Washington show that decreased fecundity of northern spotted owls are related to lower temperatures and high precipitation in the early nesting season (Forsman *et al.* 2011).

### ***Disturbance-Related Effects***

The effects of noise on NSOs are largely unknown, and whether noise is a concern has been a controversial issue. The effect of noise on birds is extremely difficult to determine due to the inability of most studies to quantify one or more of the following variables: 1) timing of the disturbance in relation to nesting chronology; 2) type, frequency, and proximity of human disturbance; 3) clutch size; 4) health of individual birds; 5) food supply; and 6) outcome of previous interactions between birds and humans (Knight and Skagan 1988). Additional factors that confound the issue of disturbance include the individual bird's tolerance level, ambient sound levels, physical parameters of sound and how it reacts with topographic characteristics and vegetation, and differences in how species perceive noise.

Although information specific to behavioral responses of NSOs to disturbance is limited, research indicates that close proximity to recreational hikers can cause Mexican spotted owls (*S. o. lucida*) to flush from their roosts (Swarthout and Steidl 2001) and helicopter overflights can reduce prey delivery rates to nests (Delaney *et al.* 1999). Additional effects from disturbance, including altered foraging behavior and decreases in nest attendance and reproductive success, have been reported for other raptors (White and Thurow 1985; Andersen *et al.* 1989; McGarigal *et al.* 1991).

Northern spotted owls may also respond physiologically to a disturbance without exhibiting a significant behavioral response. In response to environmental stressors, vertebrates secrete stress hormones called corticosteroids (Campbell 1990). Although these hormones are essential for survival, extended periods with elevated stress hormone levels may have negative effects on reproductive function, disease resistance, or physical condition (Carsia and Harvey 2000; Sapolsky *et al.* 2000). In avian species, the secretion of corticosterone is the primary non-specific stress response (Carsia and Harvey 2000). The quantity of this hormone in feces can be used as a measure of physiological stress (Wasser *et al.* 1997). Recent studies of fecal corticosterone levels of northern spotted owls indicate that low intensity noise of short duration and minimal repetition does not elicit a physiological stress response (Tempel & Gutiérrez 2003; Tempel & Gutiérrez 2004). However, prolonged activities, such as those associated with timber harvest, may increase fecal corticosterone levels depending on their proximity to northern spotted owl core areas (Wasser *et al.* 1997; Tempel & Gutiérrez 2004).

### **Conservation Needs of the Northern Spotted Owl**

Since 1990, various efforts have addressed the conservation needs of the northern spotted owl and attempted to formulate conservation strategies based upon these needs. These early efforts began with the ISC's Conservation Strategy (Thomas *et al.* 1990); they continued with the

designation of critical habitat (57 FR 1796), the Draft Recovery Plan (Service 1992), and the Scientific Analysis Team report (Thomas *et al.* 1993), report of the Forest Ecosystem Management Assessment Team (Thomas and Raphael 1993); and they culminated with the NWFP (USFS and BLM 1994a). Each conservation strategy was based upon the reserve design principles first articulated in the ISC's report. The NWFP currently guides the management of 15 National Forests and 6 Bureau of Land Management Districts across the range of the northern spotted owl.

On July 16, 2009, the Department of Interior announced plans to do a thorough review of the 2008 Recovery Plan (Service 2008) by accounting for scientific and technical reviews by prominent national scientific organizations, as well as forthcoming new data on the status of the northern spotted owl population. As a result, the Service completed the Revised Recovery Plan for the Northern Spotted Owl (Service 2011) on June 28, 2011, which built upon the earlier efforts described above and emerging scientific information on climate change and habitat modeling. The new plan reaffirms that the two main threats to northern spotted owls are habitat loss and competition from barred owls. The new plan does not recommend use of the MOCA system on Federal lands that was recommended by the 2008 plan, and instead completed a range-wide, multi-step habitat modeling tool to help evaluate and inform management decisions and Proposed Revised Critical Habitat (77 FR 14062). The 2011 Revised Recovery Plan established 12 recovery units based on the existing physiographic provinces (Figure 1; Service 2011) and identified the following recovery strategy components as necessary to conserve (*i.e.*, provide for survival and recovery) the northern spotted owl:

1. Development of a range-wide habitat modeling framework as an informational tool to better enable future land management decisions;
2. Development of management options to address the threat posed by barred owls;
3. Conservation of northern spotted owl sites and high value spotted owl habitat;
4. Implementation of ecological forestry and active forest restoration to meet the challenges of climate change and altered ecological processes;
5. The potential need for State and private lands to contribute to northern spotted owl recovery in certain areas;
6. Monitoring and research; and
7. Implementation of adaptive management concepts.

## **Federal Contribution to Recovery**

### ***Northwest Forest Plan***

Since it was signed on April 13, 1994, the NWFP has guided the management of Federal forest lands within the range of the northern spotted owl (USFS and BLM 1994a, 1994b). The NWFP was designed to protect large blocks of old growth forest and provide habitat for species that depend on those forests including the northern spotted owl, as well as to produce a predictable and sustainable level of timber sales. The NWFP included land use allocations which would provide for population clusters of northern spotted owls (*i.e.*, demographic support) and maintain connectivity between population clusters. Certain land use allocations in the plan contribute to supporting population clusters: LSRs, Managed Late-successional Areas, and Congressionally

Reserved areas. Riparian Reserves, Adaptive Management Areas and Administratively Withdrawn areas can provide both demographic support and connectivity/dispersal between the larger blocks, but were not necessarily designed for that purpose. Matrix areas were to support timber production while also retaining biological legacy components important to old-growth obligate species (in 100-acre owl cores, 15 percent late-successional provision, etc. (USFS and BLM 1994a; Service 1994b) which would persist into future managed timber stands.

The NWFP with its range-wide system of LSRs was based on work completed by three previous studies (Thomas *et al.* 2006): the 1990 Interagency Scientific Committee (ISC) Report (Thomas *et al.* 1990), the 1991 report for the Conservation of Late-successional Forests and Aquatic Ecosystems (Johnson *et al.* 1991), and the 1993 report of the Scientific Assessment Team (Thomas *et al.* 1993).

The Forest Ecosystem Management Assessment Team predicted based on expert opinion, the northern spotted owl population would decline in the Matrix land use allocation over time, while the population would stabilize and eventually increase within LSRs as habitat conditions improved over the next 50 to 100 years (Thomas and Raphael 1993; USFS and BLM 1994b). Based on the results of the first decade of monitoring, Lint (2005) could not determine whether implementation of the NWFP would reverse the northern spotted owl's declining population trend because not enough time had passed to provide the necessary measure of certainty. However, the results from the first decade of monitoring do not provide any reason to depart from the objective of habitat maintenance and restoration as described in the NWFP (Lint 2005; Noon and Blakesley 2006). Bigley and Franklin (2004) suggested that more fuels treatments are needed in east-side forests to preclude large-scale losses of habitat to stand-replacing wildfires. Other stressors that occur in suitable habitat, such as the range expansion of the barred owl (already in action) and infection with WNV (which may or may not occur) may complicate the conservation of the northern spotted owl. Recent reports about the status of the northern spotted owl offer few management recommendations to deal with these emerging threats. The arrangement, distribution, and resilience of the NWFP land use allocation system may prove to be the most appropriate strategy in responding to these unexpected challenges (Bigley and Franklin 2004).

Under the NWFP, the agencies anticipated a decline of northern spotted owl populations during the first decade of implementation. Anthony *et al.* (2006) identified greater than expected northern spotted owl declines in Washington and northern portions of Oregon, and more stationary populations in southern Oregon and northern California. In a more recent analysis, Forsman *et al.* (2011) found an estimated decline of 2.8 percent per year on Federal lands within the range of the northern spotted owl.

### **Conservation Efforts on Non-Federal Lands**

In the report from the Interagency Scientific Committee (Thomas *et al.* 1990), the draft recovery plan (Service 1992), the Revised Recovery Plan (USDI FWS 1011), and the report from the Forest Ecosystem Management Assessment Team (Thomas and Raphael 1993), it was noted that limited Federal ownership in some areas constrained the ability to form a network of old-forest reserves to meet the conservation needs of the northern spotted owl. In these areas in particular,

non-Federal lands would be important to the range-wide goal of achieving conservation and recovery of the northern spotted owl. The U.S. Fish and Wildlife Service's primary expectations for private lands are for their contributions to demographic support (pair or cluster protection) to Federal lands, or their connectivity with Federal lands. In addition, timber harvest within each state is governed by rules that provide protection of northern spotted owls or their habitat to varying degrees.

There are 17 current or completed Habitat Conservation Plans (HCPs) that have incidental take permits issued for northern spotted owls—eight in Washington, three in Oregon, and four in California (Service 2008). The HCPs range in size from 40 acres to more than 1.6 million acres, although not all acres are included in the mitigation for northern spotted owls. In total, the HCPs cover approximately 2.9 million acres (9.1 percent) of the 32 million acres of non-Federal forest lands in the range of the northern spotted owl. The period of time that the HCPs will be in place ranges from 5 to 100 years; however, most of the HCPs are of fairly long duration. While each HCP is unique, there are several general approaches to mitigation of incidental take:

- Reserves of various sizes, some associated with adjacent Federal reserves
- Forest harvest that maintains or develops suitable habitat
- Forest management that maintains or develops dispersal habitat
- Deferral of harvest near specific sites

**Washington.** In 1996, the State Forest Practices Board adopted rules (Washington Forest Practices Board 1996) that would contribute to conserving the northern spotted owl and its habitat on non-Federal lands. Adoption of the rules was based in part on recommendations from a Science Advisory Group that identified important non-Federal lands and recommended roles for those lands in northern spotted owl conservation (Hanson *et al.* 1993; Buchanan *et al.* 1994). The 1996 rule package was developed by a stakeholder policy group and then reviewed and approved by the Forest Practices Board (Buchanan and Swedeen 2005). Northern spotted owl-related HCPs in Washington generally were intended to provide demographic or connectivity support (Service 1992).

**Oregon.** The Oregon Forest Practices Act provides for protection of 28.3 ha (70 acre) core areas around sites occupied by an adult pair of northern spotted owls capable of breeding (as determined by recent protocol surveys), but it does not provide for protection of northern spotted owl habitat beyond these areas (Oregon Department of Forestry 2007). In general, no large-scale northern spotted owl habitat protection strategy or mechanism currently exists for non-Federal lands in Oregon. The two northern spotted owl-related HCPs currently in effect cover more than 121,406 ha (207,000 acres) of non-Federal lands. These HCPs are intended to provide some nesting habitat and connectivity over the next few decades (Service 2008).

Additionally the Oregon Department of Forestry (ODF), USDA Natural Resources Conservation Service (NRCS), and the Service have entered into a 50-year programmatic Safe Harbor Agreement (SHA) under section 10(a)1(A) of the Endangered Species Act on July 26, 2010. The

intent of the SHA is to manage up to a total of 50,000 acres of forest in a manner that would benefit the northern spotted owl on private lands throughout the owl's range in Oregon. The SHA establishes baseline conditions regarding northern spotted owl habitat for each property at the time of enrollment under the SHA. Those baseline habitat conditions need to be maintained throughout the duration of the properties' enrollment. In addition, the SHA is intended to increase the amount of available northern spotted owl habitat through forest management activities. Landowners are allowed to return to their original baseline conditions at the end of their enrollment should they decide to do so. A condition of enrollment under the SHA is to participate in a Steward Agreement with ODF, which provides an alternative means of complying with Oregon's State Forest Practices Act. Through the Healthy Forest Reserve Program, NRCS has been able to provide funding for the purchase of permanent conservation easements as well as forest management activities for qualified, interested private landowners for the first few years of the SHA. ODF is in the process of completing a few Stewardship Agreements after they have gone out for public comment and then formally enrolling those properties under the SHA. We anticipate several properties comprising up to a few thousand acres will be enrolled by the end of 2011.

**California.** The California State Forest Practice Rules, which govern timber harvest on private lands, require surveys for northern spotted owls in suitable habitat and to provide protection around activity centers (California Department of Forestry and Fire Protection 2007). Under the Forest Practice Rules, no timber harvest plan can be approved if it is likely to result in incidental take of federally listed species, unless the take is authorized by a Federal incidental take permit (California Department of Forestry and Fire Protection 2007). The California Department of Fish and Game initially reviewed all timber harvest plans to ensure that take was not likely to occur; the U.S. Fish and Wildlife Service took over that review function in 2000. Several large industrial owners operate under northern spotted owl management plans that have been reviewed by the U.S. Fish and Wildlife Service and that specify basic measures for northern spotted owl protection. Four HCPs authorizing take of northern spotted owls have been approved; these HCPs cover more than 669,000 acres of non-Federal lands. Implementation of these plans is intended to provide for northern spotted owl demographic and connectivity support to NWFP lands (Service 2008).

### **Current Condition of the Northern Spotted Owl**

The current condition of the species incorporates the effects of all past human activities and natural events that led to the present-day status of the species and its habitat (Service and NMFS 1998).

### ***Range-wide Habitat and Population Trends***

#### **Habitat Baseline**

The Service has used information provided by the Forest Service, Bureau of Land Management, and National Park Service to update the habitat baseline conditions on Federal lands for northern spotted owls on several occasions since the northern spotted owl was listed in 1990. The estimate of 7.4 million acres used for the NWFP in 1994 (USFS and BLM 1994b) was believed to be

representative of the general amount of northern spotted owl habitat on these lands. This baseline has been used to track relative changes over time in subsequent analyses, including those presented here. Reliable habitat baseline information for non-Federal lands is not available (Courtney *et al.* 2004); consequently, consulted-on acres can be tracked, but not evaluated in the context of change with respect to a reference condition on non-Federal lands.

### **NWFP Lands Analysis 1994–2001**

In 2001, the Service conducted an assessment of habitat baseline conditions, the first since implementation of the NWFP (Service 2001). This range-wide evaluation of habitat, compared to the FSEIS, was necessary to determine if the rate of potential change to northern spotted owl habitat was consistent with the change anticipated in the NWFP. In particular, the Service considered habitat effects that were documented through the section 7 consultation process since 1994. In general, the analytical framework of these consultations focused on the reserve and connectivity goals established by the NWFP land-use allocations (USFS and BLM 1994a), with effects expressed in terms of changes in suitable northern spotted owl habitat within those land-use allocations. The Service determined that actions and effects were consistent with the expectations for implementation of the NWFP from 1994 to June 2001 (Service 2001).

### **Range-wide Analysis 1994–September 5, 2012**

This section updates the information considered in USDI FWS (2001), relying particularly on information in documents the Service produced pursuant to section 7 of the Act and information provided by NWFP agencies on habitat loss resulting from natural events (e.g., fires, windthrow, insect and disease). To track impacts to northern spotted owl habitat, the Service designed the Consultation Effects Tracking System database which records impacts to northern spotted owls and their habitat at a variety of spatial and temporal scales. In 2011, the Service replaced the Consultation Effects Tracking System with the Consulted on Effects Database. The replacement of the Consultation Effects Tracking System with the Consulted on Effects Database, corrects technical issues documented in previous consultations. Data are entered into the Consulted on Effects Database under various categories including, land management agency, land-use allocation, physiographic province, and type of habitat affected.

In 1994, about 7.4 million acres of suitable northern spotted owl habitat were estimated to exist on Federal lands managed under the NWFP. As of September 5, 2012, the Service had consulted on the proposed removal/downgrading of approximately 192,787 acres (Table 1) or 2.6 percent of 7.4 million acres (Table 2) of northern spotted owl suitable habitat on Federal lands. Of the total Federal acres consulted on for removal/downgrading, approximately 164,352 acres or 2.2 percent of 7.4 million acres of northern spotted owl habitat were removed/downgraded as a result of timber harvest. These changes in suitable northern spotted owl habitat are consistent with the expectations for implementation of the NWFP (USFS and BLM 1994a).

April 13, 2004 marked the start of the second decade of the NWFP. Decade specific baselines and summaries of effects by State, physiographic province and land use function from proposed management activities and natural events are not provided here, but can be calculated using the Service's Consulted on Effects Database.

Habitat loss from Federal lands due to management activities has varied among the individual provinces with most of the impacts concentrated within the Non-Reserve relative to the Reserve land-use allocations (Table 2). When habitat loss is evaluated as a proportion of the affected acres range-wide, the most pronounced losses have occurred within Oregon (72 percent), especially within its Klamath Mountains (36.6 percent) and Cascades (East and West) (34.8 percent) provinces (Table 2), followed by much smaller habitat losses in Washington (9.3 percent) and California (18.4 percent)(Table 2). When habitat loss is evaluated as a proportion of provincial baselines, the Oregon Klamath Mountains (20.4 percent), Cascades East (13.0 percent), and the California Klamath (6.9 percent) provinces all have proportional losses greater than the loss of habitat across all provinces (5.9 percent; Table 2).

From 1994 through September 5, 2012, habitat lost due to natural events was estimated at approximately 246,111 acres range-wide (Table 2). About two-thirds of this loss was attributed to the Biscuit Fire that burned over 500,000 acres in southwest Oregon (Rogue River basin) and northern California in 2002. This fire resulted in a loss of approximately 113,451 acres of northern spotted owl habitat, including habitat within five LSRs. Approximately 18,630 acres of northern spotted owl habitat were lost due to the B&B Complex and Davis Fires in the East Cascades Province of Oregon (Table 2<sup>7</sup>).

Because there is no comprehensive northern spotted owl habitat baseline for non-NWFP Federal lands and non-Federal lands, there is little available information regarding northern spotted owl habitat trends on these lands. Yet, we do know that internal Service consultations conducted since 1992, have documented the eventual loss of 472,772 acres (Table 1) acres of habitat on non-Federal lands. Most of these losses have yet to be realized because they are part of large-scale, long-term HCPs. Combining effects on Federal and non-Federal lands, the Service had consulted on the proposed removal of approximately 665,559 acres of northern spotted owl habitat range-wide, resulting from all management activities, as of September 5, 2012 (Table 1).

Table 1. Range-wide aggregate of changes to NRF<sup>1</sup> habitat acres from activities subject to section 7 consultations and other causes from 1994 to September 5, 2012.

Land Ownership	Consulted On Habitat Changes <sup>2</sup>		Other Habitat Changes <sup>3</sup>	
	Removed/ Downgraded	Maintained/ Improved	Removed/ Downgraded	Maintained/ Improved
NWFP (FS, BLM, NPS)	192,787	520,871	246,111	39,720
Bureau of Indian Affairs/Tribes	108,210	28,372	2,398	0
Habitat Conservation Plans/Safe Harbor Agreements	295,889	14,430	N/A	N/A
Other Federal, State, County, Private Lands	68,673	21,894	279	0
<b>Total Changes</b>	<b>665,559</b>	<b>585,567</b>	<b>248,788</b>	<b>39,720</b>

<sup>1</sup>Nesting, roosting, foraging (NRF) habitat. In California, suitable habitat is divided into two components; nesting - roosting (NR) habitat, and foraging (F) habitat. The NR component most closely resembles NRF habitat in Oregon and Washington. Due to differences in reporting methods, effects to suitable habitat compiled in this, and all subsequent tables include effects for nesting, roosting, and foraging (NRF) for 1994-6/26/2001. After 6/26/2001 suitable habitat includes NRF for Washington and Oregon but only nesting and roosting (NR) for California.

<sup>2</sup>Includes both effects reported in USFWS 2001 and subsequent effects reported in the Northern Spotted Owl Consultation Effects Tracking System (web application and database.)

<sup>3</sup>Includes effects to suitable NRF habitat (as generally documented through technical assistance, etc.) resulting from wildfires (not from suppression efforts), insect and disease outbreaks, and other natural causes, private timber harvest, and land exchanges not associated with consultation.

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Table 2. Aggregate results of all adjusted, suitable habitat (NRF<sup>1</sup>) acres affected by section 7 consultation on NWFP lands for the northern spotted owl; baseline and summary of effects by state, physiographic province and land use function.

Physiographic Province <sup>2</sup>	Evaluation Baseline <sup>3</sup>	Habitat Removed/Downgraded <sup>4</sup>				Habitat Loss to Natural Events <sup>7</sup>	Total	% Provincial Baseline Affected	% Range-wide Effects
		Land Use Allocations		Total	% Provincial Baseline Affected				
		Reserves <sup>5</sup>	Non-Reserves <sup>6</sup>						
<b>WA</b>	Eastern Cascades	706,849	4,522	6,392	10,914	14,307	25,221	3.57	5.75
	Olympic Peninsula	560,217	869	1,711	2,580	299	2,879	0.51	0.66
	Western Cascades	1,112,480	1,691	10,870	12,561	3	12,564	1.13	2.86
<b>OR</b>	Cascades East	443,659	2,589	14,309	16,898	40,884	57,782	13.02	13.17
	Cascades West	2,046,472	3,872	66,274	70,146	24,583	94,729	4.63	21.58
	Coast Range	516,577	447	3,994	4,441	66	4,507	0.87	1.03
	Klamath Mountains	785,589	2,631	56,269	58,900	101,676	160,576	20.44	36.59
	Willamette Valley	5,658	0	0	0	0	0	0	0
<b>CA</b>	Cascades	88,237	10	4,820	4,830	329	5,159	5.85	1.18
	Coast	51,494	464	79	543	275	818	1.59	0.19
	Klamath	1,079,866	1,546	9,428	10,974	63,689	74,663	6.91	17.01
	<b>Total</b>	<b>7,397,098</b>	<b>18,641</b>	<b>174,146</b>	<b>192,787</b>	<b>246,111</b>	<b>438,898</b>	<b>5.93</b>	<b>100</b>

<sup>1</sup>Nesting, roosting, foraging (NRF) habitat. In California, suitable habitat is divided into two components: nesting - roosting (NR) habitat, and foraging (F) habitat. The NR component most closely resembles NRF habitat in Oregon and Washington. Due to differences in reporting methods, effects to suitable habitat compiled in this, and all subsequent tables include effects for nesting, roosting, and foraging (NRF) for 1994-6/26/2001. After 6/26/2001 suitable habitat includes NRF for Washington and Oregon but only nesting and roosting (NR) for California.

<sup>2</sup>Defined by the Northwest Forest Plan as the twelve physiographic provinces, as presented in Figure 3&4-1 on page 3&4-16 of the FSEIS. The WA Western Lowlands and OR Willamette Valley provinces are not listed as they are not expected to contribute to recovery.

<sup>3</sup>1994 FSEIS baseline (USFS and BLM 1994b).

<sup>4</sup>Includes both effects reported in USFWS 2001 and subsequent effects reported in the Northern Spotted Owl Consultation Effects Tracking System (web application and database.)

<sup>5</sup>Land-use allocations intended to provide large blocks of habitat to support clusters of breeding pairs. (LSR, MLSA, CRA)

<sup>6</sup>Land-use allocations intended to provide habitat to support movement of spotted owls among reserves. (AWA, AMA, MX)

<sup>7</sup>Acres for all physiographic provinces, except the Oregon Klamath Mountains, are from the Scientific Evaluation of the Status of the Northern Spotted Owl (Courtney *et al.* 2004) and subsequent effects entered into the Northern Spotted Owl Consultation Effects Tracking System. Acres for the Oregon Klamath Mountains province are from the biological assessment entitled: Fiscal year 2006-2008 programmatic consultation: re-initiation on activities that may affect listed species in the Rogue-River/South Coast Basin, Medford BLM, and Rogue-Siskiyou National Forest and from subsequent effects entered into the Northern Spotted Owl Consultation Effects Tracking System.

### **Other Habitat Trend Assessments**

In 2005, the Washington Department of Wildlife released the report, "An Assessment of Northern Spotted Owl Habitat on Non-Federal Lands in Washington between 1996 and 2004" (Pierce *et al.* 2005). This study estimates the amount of northern spotted owl habitat in 2004 on lands affected by state and private forest practices. The study area is a subset of the total Washington forest practice lands, and statistically-based estimates of existing habitat and habitat loss due to fire and timber harvest are provided. In the 3.2-million acre study area, Pierce *et al.* (2005) estimated there was 816,000 acres of suitable northern spotted owl habitat in 2004, or about 25 percent of their study area. Based on their results, Pierce and others (2005) estimated there were less than 2.8 million acres of northern spotted owl habitat in Washington on all ownerships in 2004. Most of the suitable owl habitat in 2004 (56 percent) occurred on Federal lands, and lesser amounts were present on state-local lands (21 percent), private lands (22 percent) and tribal lands (1 percent). Most of the harvested northern spotted owl habitat was on private (77 percent) and state-local (15 percent) lands. A total of 172,000 acres of timber harvest occurred in the 3.2 million-acre study area, including harvest of 56,400 acres of suitable northern spotted owl habitat. This represented a loss of about 6 percent of the owl habitat in the study area distributed across all ownerships (Pierce *et al.* 2005). Approximately 77 percent of the harvested habitat occurred on private lands and about 15 percent occurred on State lands. Pierce and others (2005) also evaluated suitable habitat levels in 450 northern spotted owl management circles (based on the provincial annual median northern spotted owl home range). Across their study area, they found that owl circles averaged about 26 percent suitable habitat in the circle across all landscapes. Values in the study ranged from an average of 7 percent in southwest Washington to an average of 31 percent in the east Cascades, suggesting that many owl territories in Washington are significantly below the 40 percent suitable habitat threshold used by the State as a viability indicator for northern spotted owl territories (Pierce *et al.* 2005).

Moeur *et al.* 2005 estimated an increase of approximately 1.25 to 1.5 million acres of medium and large older forest (greater than 20 inches dbh, single and multi-storied canopies) on Federal lands in the Northwest Forest Plan area between 1994 and 2003. The increase occurred primarily in the lower end of the diameter range for older forest. In the greater than 30 inch dbh size class, the net area increased by only an estimated 102,000 to 127,000 acres (Moeur *et al.* 2005). The estimates were based on change-detection layers for losses due to harvest and fire and re-measured inventory plot data for increases due to ingrowth. Transition into and out of medium and large older forest over the 10-year period was extrapolated from inventory plot data on a subpopulation of Forest Service land types and applied to all Federal lands. Because size class and general canopy layer descriptions do not necessarily account for the complex forest structure often associated with northern spotted owl habitat, the significance of these acres to northern spotted owl conservation remains unknown.

### **Northern Spotted Owl Numbers, Distribution, and Reproduction Trends**

There are no estimates of the size of the northern spotted owl population prior to settlement by Europeans. Northern spotted owls are believed to have inhabited most old-growth forests or stands throughout the Pacific Northwest, including northwestern California, prior to beginning of modern settlement in the mid-1800s (USDI FWS 1989). According to the final rule listing the

northern spotted owl as threatened (55 FR 26114), approximately 90 percent of the roughly 2,000 known northern spotted owl breeding pairs were located on Federally managed lands, 1.4 percent on State lands, and 6.2 percent on private lands; the percent of northern spotted owls on private lands in northern California was slightly higher (USDI FWS 1989; Thomas *et al.* 1990).

The current range of the northern spotted owl extends from southwest British Columbia through the Cascade Mountains, coastal ranges, and intervening forested lands in Washington, Oregon, and California, as far south as Marin County (55 FR 26114). The range of the northern spotted owl is partitioned into 12 physiographic provinces (Figure 1) based on recognized landscape subdivisions exhibiting different physical and environmental features (Service 1992).

There are few northern spotted owls remaining in British Columbia. Chutter *et al.* (2004) suggested immediate action was required to improve the likelihood of recovering the northern spotted owl population in British Columbia. So, in 2007, personnel in British Columbia captured and brought into captivity 16 wild northern spotted owls (Service 2008). Prior to initiating the captive-breeding program, the population of northern spotted owls in Canada was declining by as much as 10.4 percent per year (Chutter *et al.* 2004). Currently, only six northern spotted owls are known to exist in the wild in British Columbia (Pynn 2010). Biologists plan to capture two of the remaining single males for their captive breeding program (Pynn 2010). The other four northern spotted owls comprise two pairs and will continue to remain in the wild, with any offspring removed for captive breeding. Provincial biologists have lethally controlled 12 barred owls that represented competition for the last remaining northern spotted owls. The amount of previous interaction between northern spotted owls in Canada and the United States is unknown. The northern spotted owl has also become rare in southwestern Washington, and the northern coastal ranges of Oregon.

As of July 1, 1994, there were 5,431 known site-centers of northern spotted owl pairs or resident singles: 851 sites (16 percent) in Washington, 2,893 sites (53 percent) in Oregon, and 1,687 sites (31 percent) in California (60 FR 9483). By June 2004, the number of territorial northern spotted owl sites in Washington recognized by the Washington Department of Fish and Wildlife was 1,044 (Buchanan and Swedeen 2005). Over time, the northern spotted owl has become increasingly rare in southwestern Washington, and the northern coastal ranges of Oregon. The actual number of currently occupied northern spotted owl locations across the range is unknown because many areas remain unsurveyed (Service 2008). In addition, many historical sites are no longer occupied because northern spotted owls have been displaced by barred owls, timber harvest, or severe fires, and it is possible that some new sites have been established due to reduced timber harvest on Federal lands since 1994. The totals in 60 FR 9483 represent the cumulative number of locations recorded in the three states, not population estimates.

Because the existing survey coverage and effort are insufficient to produce reliable range-wide estimates of population size, demographic data are used to evaluate trends in northern spotted owl populations. Analysis of demographic data can provide an estimate of the finite rate of population change ( $\lambda$ ) (lambda), which provides information on the direction and magnitude of population change. A  $\lambda$  of 1.0 indicates a stationary population, meaning the population is neither increasing nor decreasing. A  $\lambda$  of less than 1.0 indicates a decreasing population, and a  $\lambda$  of greater than 1.0 indicates a growing population. Demographic data, derived from studies

initiated as early as 1985, have been analyzed periodically (Anderson and Burnham 1992; Burnham *et al.* 1994; Forsman *et al.* 1996; Anthony *et al.* 2006; Forsman *et al.* 2011) to estimate trends in the populations of the northern spotted owl.

In January 2009, two meta-analyses modeled rates of population change for up to 24 years (1985–2008) using the re-parameterized Jolly-Seber method ( $\lambda_{RJS}$ ). One meta-analysis modeled the 11 long-term study areas, while the other modeled the eight study areas that are part of the effectiveness monitoring program of the NWFP (Forsman *et al.* 2011).

Table 3. Northern spotted owl demographic study areas (adapted from Forsman *et al.* 2011).

Study Area	Fecundity	Apparent Survival <sup>1</sup>	$\lambda_{RJS}$	Population change <sup>2</sup>
Cle Elum <sup>3</sup>	Declining	Declining	0.937	Declining
Rainier	Increasing	Declining	0.929	Declining
Olympic <sup>3</sup>	Stable	Declining	0.957	Declining
Coast Ranges <sup>3</sup>	Increasing	Declining since 1998	0.966	Declining
HJ Andrews <sup>3</sup>	Increasing	Declining since 1997	0.977	Declining
Tyee <sup>3</sup>	Stable	Declining since 2000	0.996	Stationary
Klamath <sup>3</sup>	Declining	Stable	0.990	Stationary
Southern Cascades <sup>3</sup>	Declining	Declining since 2000	0.982	Stationary
NW California <sup>3</sup>	Declining	Declining	0.983	Declining
Hoopa	Stable	Declining since 2004	0.989	Stationary
Green Diamond	Declining	Declining	0.972	Declining

<sup>1</sup> Apparent survival calculations are based on model average.

<sup>2</sup> Population trends are based on estimates of realized population change.

<sup>3</sup> Effectiveness monitoring program

Point estimates of  $\lambda_{RJS}$  were all below 1.0 and ranged from 0.929 to 0.996 for the 11 long-term study areas. There was strong evidence that populations declined on 7 of the 11 areas (Forsman *et al.* 2011), these areas included Rainier, Olympic, Cle Elum, Coast Range, HJ Andrews, Northwest California and Green Diamond. On other four areas (Tyee, Klamath, Southern Cascades, and Hoopa), populations were either stable, or the precision of the estimates was not sufficient to detect declines.

The weighted mean  $\lambda_{RJS}$  for all of the 11 study areas was 0.971 (standard error [SE] = 0.007, 95 percent confidence interval [CI] = 0.960 to 0.983), which indicated an average population decline of 2.9 percent per year from 1985 to 2006. This is a lower rate of decline than the 3.7 percent reported by Anthony *et al.* (2006), but the rates are not directly comparable because Anthony *et al.* (2006) examined a different series of years and because two of the study areas in their analysis were discontinued and not included in Forsman *et al.* (2011). Forsman *et al.* (2011) explains that the indication populations were declining was based on the fact that the 95 percent confidence intervals around the estimate of mean lambda did not overlap 1.0 (stable) or barely included 1.0. While estimates of mean  $\lambda_{RJS}$  are not directly comparable between Anthony *et al.* (2006) and Forsman *et al.* (2011), results from these studies indicate that rates of population decline for northern spotted owls have not moderated in recent years. Forsman *et al.* (2011) indicated that the number of declining populations on study areas in Washington and northern Oregon together with their rates of decline are concerning for the long-term sustainability of northern spotted owl populations throughout the range of the subspecies.

The mean  $\lambda_{RJS}$  for the eight demographic monitoring areas (Cle Elum, Olympic, Coast Range, HJ Andrews, Tyee, Klamath, Southern Cascades and Northwest California) that are part of the effectiveness monitoring program of the NWFP was 0.972 (SE = 0.006, 95 percent CI = 0.958 to 0.985), which indicated an estimated decline of 2.8 percent per year on Federal lands within the range of the northern spotted owl. The weighted mean estimate  $\lambda_{RJS}$  for the other three study areas (Rainier, Hoopa and Green Diamond) was 0.969 (SE = 0.016, 95 percent CI = 0.938 to 1.000), yielding an estimated average decline of 3.1 percent per year. These data suggest that demographic rates for northern spotted owl populations on Federal lands were somewhat better than elsewhere; however, this comparison is confounded by the interspersed non-Federal land in study areas and the likelihood that northern spotted owls use habitat on multiple ownerships in some demography study areas.

The number of populations that declined and the rate at which they have declined are noteworthy, particularly the precipitous declines in the Olympic, Cle Elum, and Rainier study areas in Washington and the Coast Range study area in Oregon. Estimates of population declines in these areas ranged from 40 to 60 percent during the study period through 2006 (Forsman *et al.* 2011). Northern spotted owl populations on the HJ Andrews, Northwest California, and Green Diamond study areas declined by 20–30 percent whereas the Tyee, Klamath, Southern Cascades, and Hoopa study areas showed declines of 5 to 15 percent.

Decreases in adult apparent survival rates were an important factor contributing to decreasing population trends. Forsman *et al.* (2011) found apparent survival rates were declining on 10 of the study area with the Klamath study area in Oregon being the exception. Estimated declines in adult survival were most precipitous in Washington where apparent survival rates were less than 80 percent in recent years, a rate that may not allow for sustainable populations (Forsman *et al.* 2011). In addition, declines in adult survival for study areas in Oregon have occurred predominately within the last five years and were not observed in the previous analysis by Anthony *et al.* (2006). Forsman *et al.* (2011) express concerns for the collective declines in adult survival across the subspecies range because northern spotted owl populations are most sensitive to changes in adult survival.

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Appendix Q Cross Sections of the Proposed  
Project, Bridge Profile Drawings,  
and Artist Renderings

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## Cross Sections of the Proposed Project

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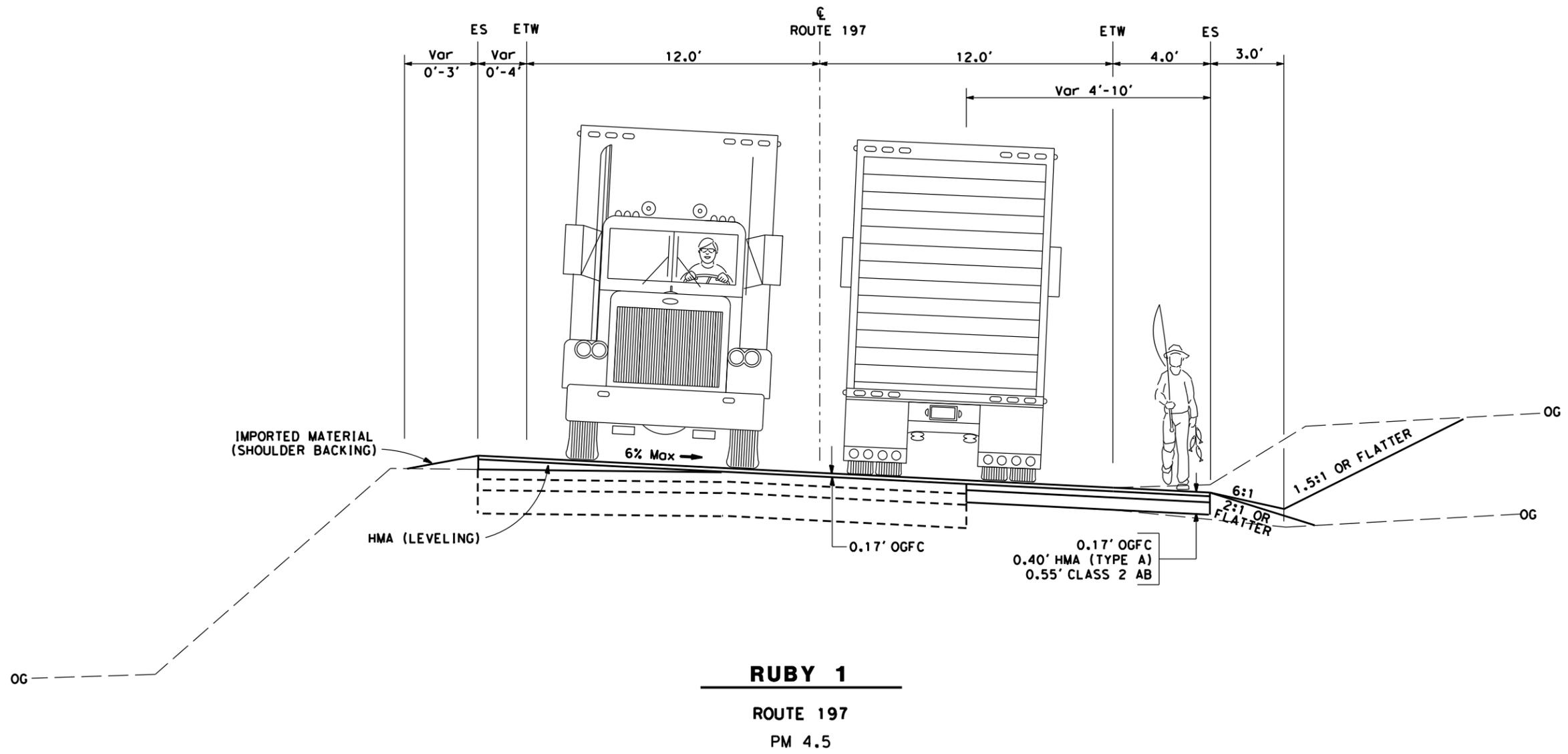
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans**

**LEGEND**

OGFC = OPEN GRADED FRICTION COURSE

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	DN	197	4.5		

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**TYPICAL CROSS SECTION**

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EA 00000

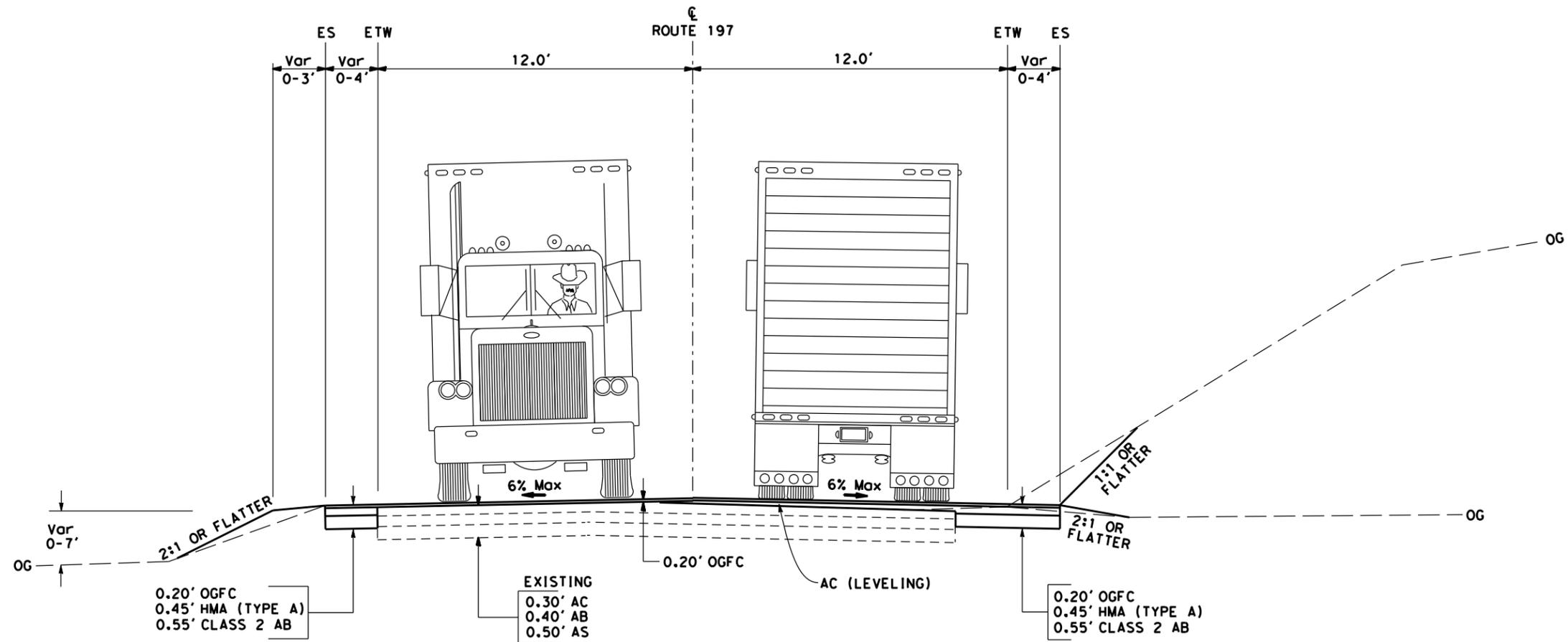
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**LEGEND**

OGFC = OPEN GRADED FRICTION COURSE



**RUBY 2**

ROUTE 197  
PM 3.20 TO PM 4.00

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	FUNCTIONAL SUPERVISOR	REVISOR	DATE
<b>Caltrans</b>	<b>CINDY GRAHAM</b>		

**TYPICAL CROSS SECTION**

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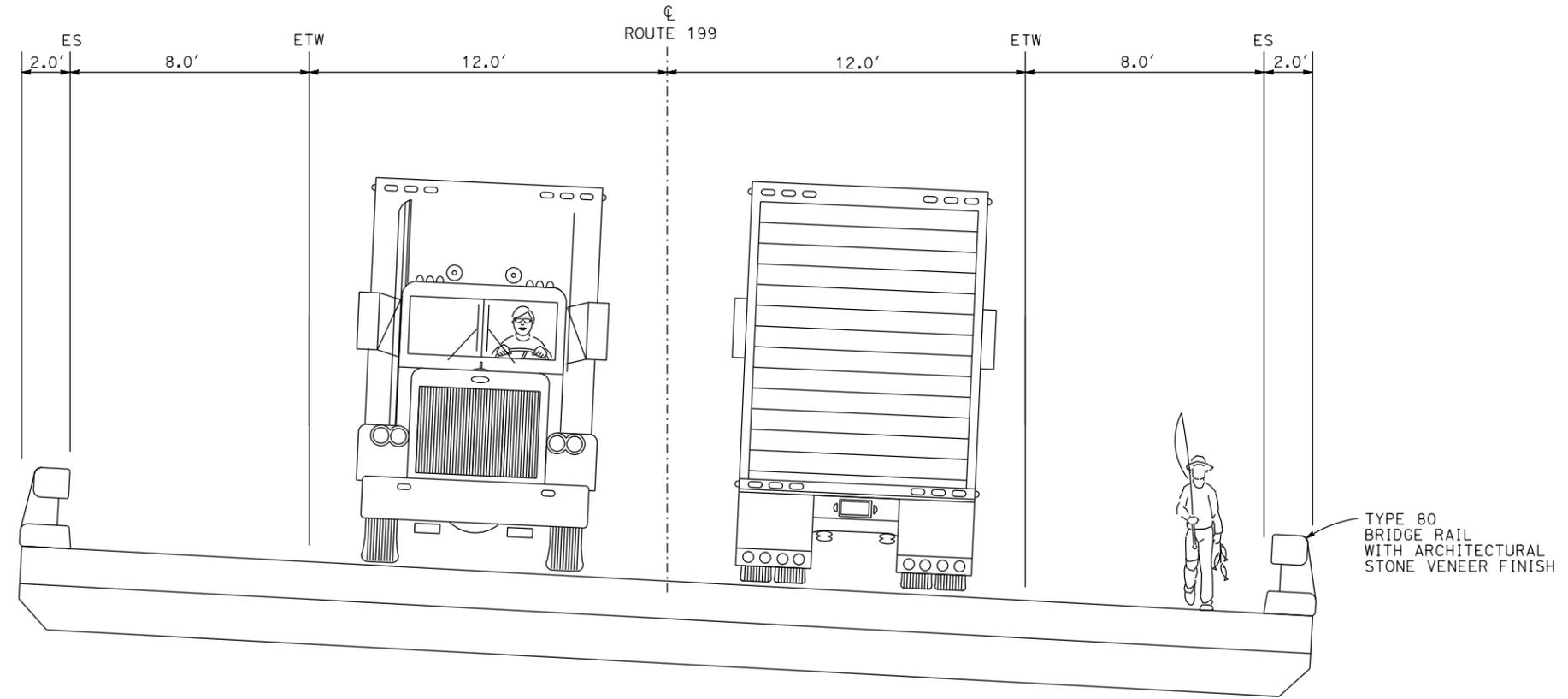


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OR AGENTS SHALL NOT BE RESPONSIBLE FOR  
THE ACCURACY OR COMPLETENESS OF ELECTRONIC  
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STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans**

FUNCTIONAL SUPERVISOR  
CALCULATED-DESIGNED BY  
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REVISED BY  
DATE REVISED

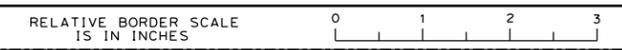


**PATRICK CREEK NARROWS**

ROUTE 199  
PM 23.9/24.2

**TYPICAL CROSS SECTION  
LOCATION 2  
DOWNSTREAM BRIDGE REPLACEMENT ALTERNATIVE**

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TIME PLOTTED => 09:06

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THE STATE OF CALIFORNIA OR ITS OFFICERS  
OR AGENTS SHALL NOT BE RESPONSIBLE FOR  
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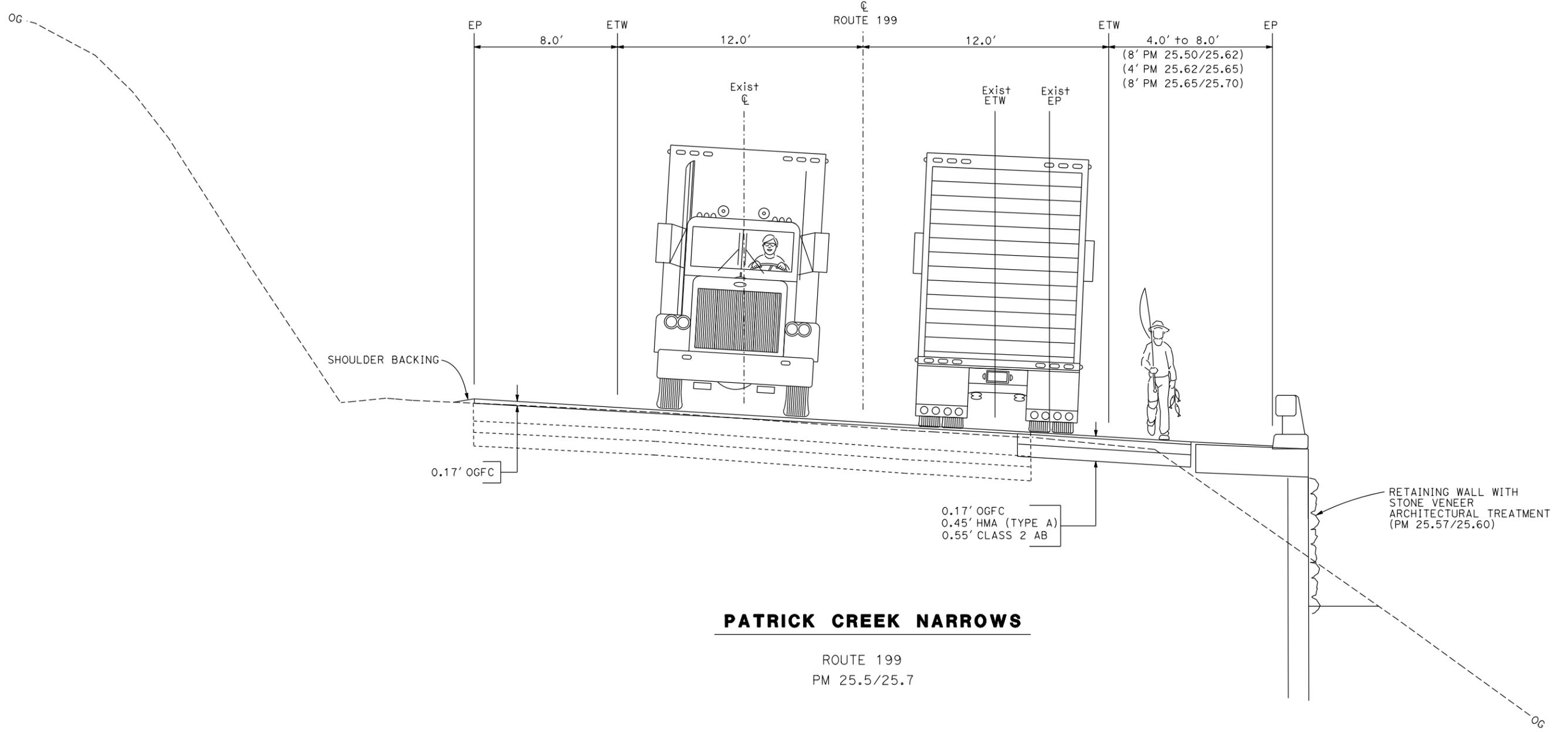
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
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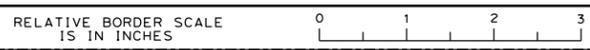


**PATRICK CREEK NARROWS**

ROUTE 199  
PM 25.5/25.7

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STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
*St* **Gibbons**

**NOTE:**

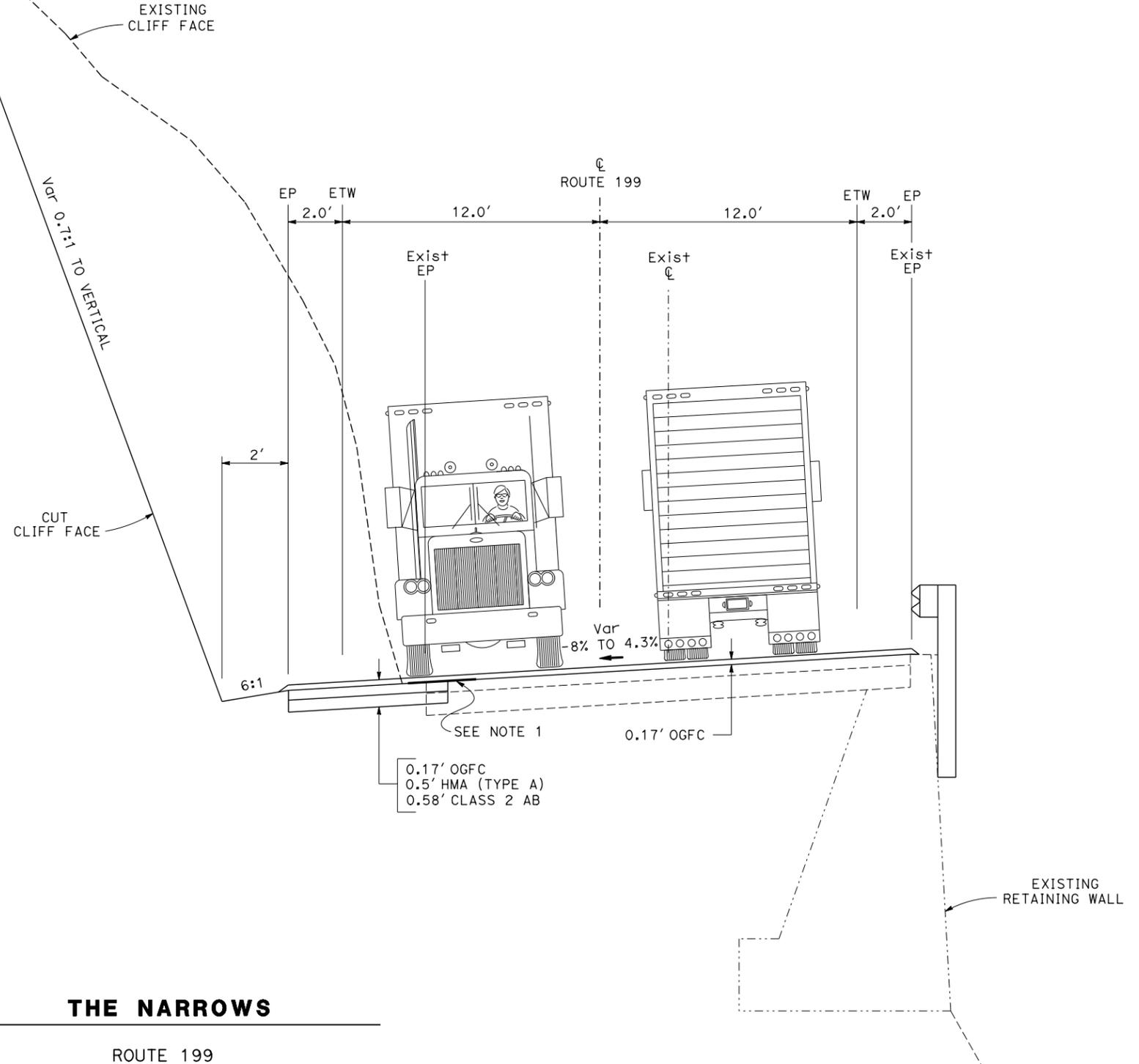
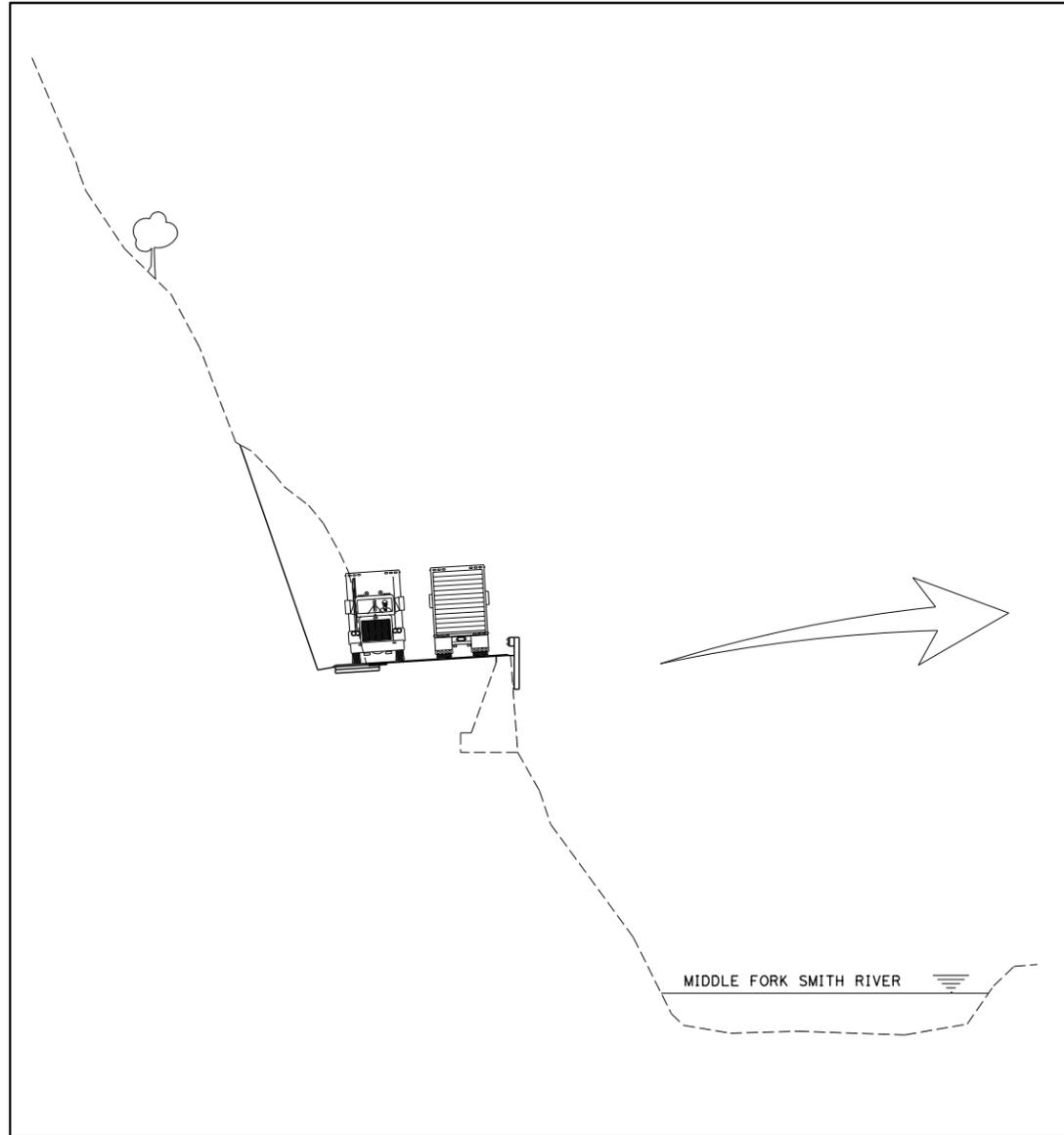
1. MILL 0.15' INTO DGAC AND PLACE GEOSYNTHETIC PAVEMENT INTERLAYER.

**LEGEND**

OGFC = OPEN GRADED FRICTION COURSE

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

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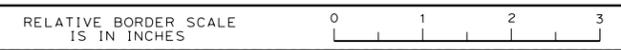


**THE NARROWS**

ROUTE 199  
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**TYPICAL CROSS SECTION**

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 LAST REVISION 00-00-00

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

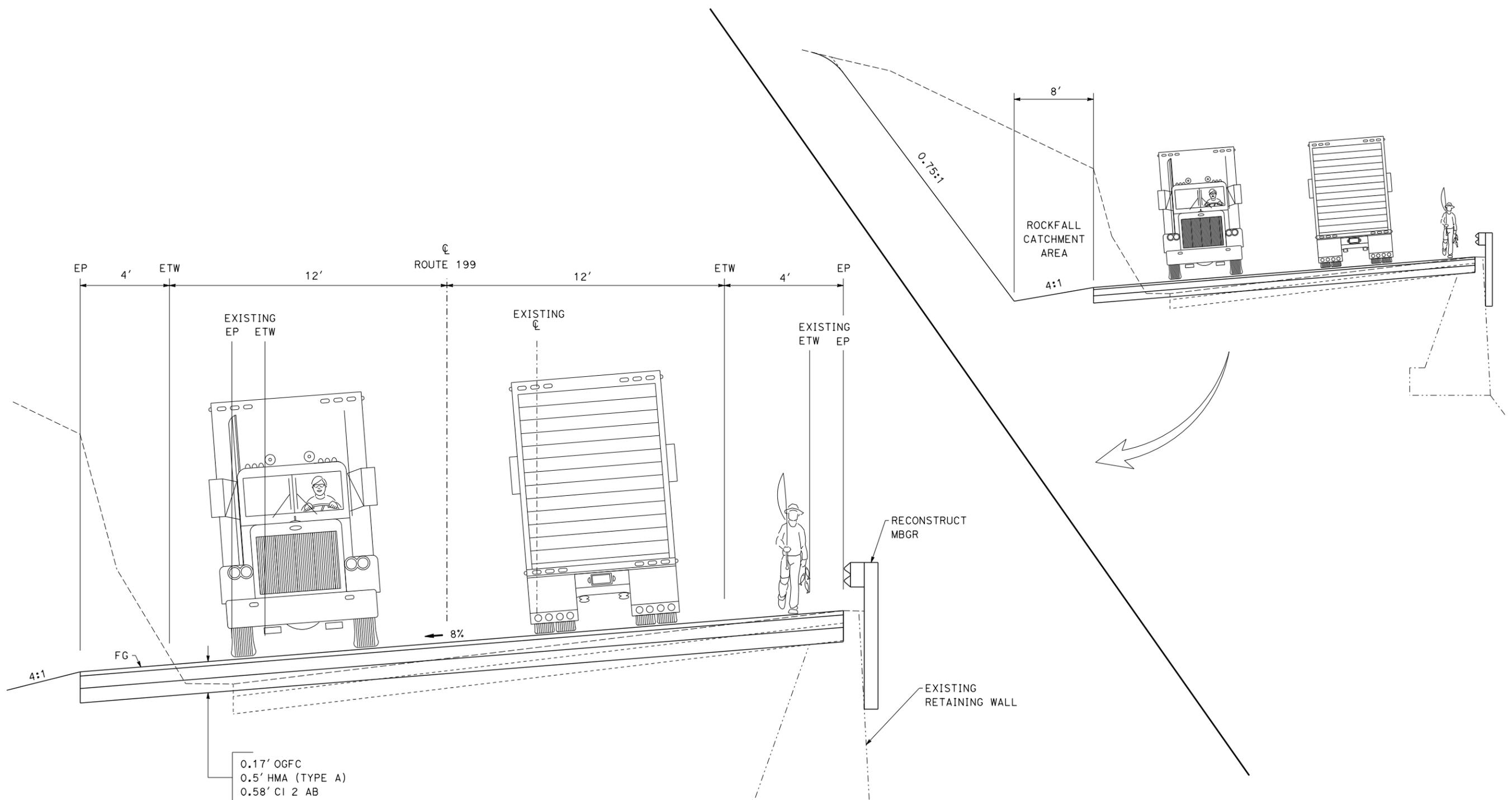
**LEGEND**  
 OGFC = OPEN GRADED FRICTION COURSE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans**

REVISOR BY  
 DATE REVISED

CALCULATED BY  
 DESIGNED BY  
 CHECKED BY

FUNCTIONAL SUPERVISOR



**WASHINGTON CURVE**

ROUTE 199  
 PM 26.5

**TYPICAL CROSS SECTION  
 CUT SLOPE ALTERNATIVE**  
 NO SCALE

RELATIVE BORDER SCALE  
 15 IN INCHES

USERNAME => s127824  
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CU 00000 EA 000000

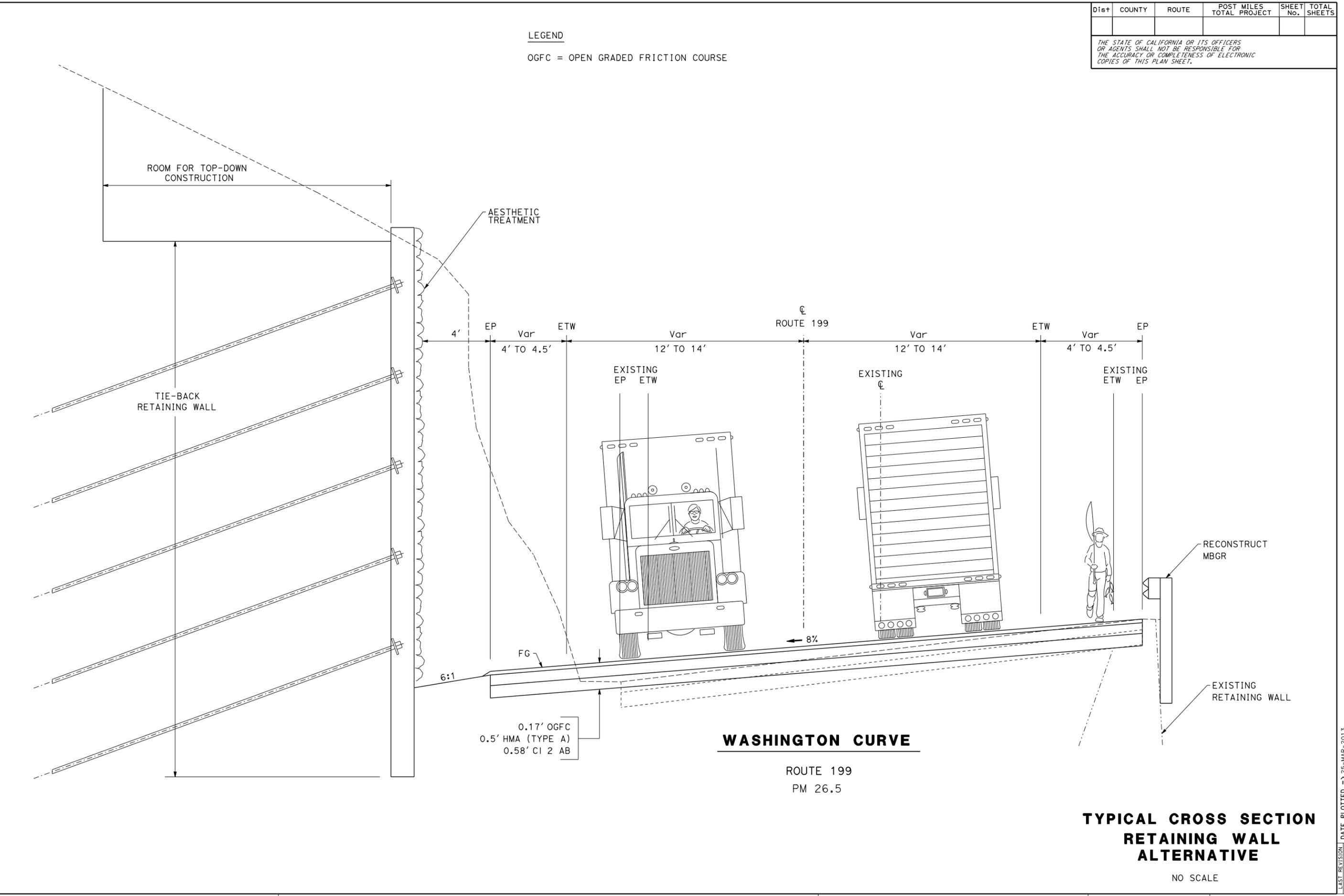
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THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

**LEGEND**  
 OGFC = OPEN GRADED FRICTION COURSE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**St. Gibbons**

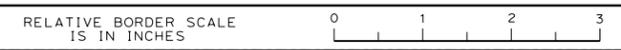


**WASHINGTON CURVE**

ROUTE 199  
 PM 26.5

**TYPICAL CROSS SECTION  
 RETAINING WALL  
 ALTERNATIVE**

NO SCALE



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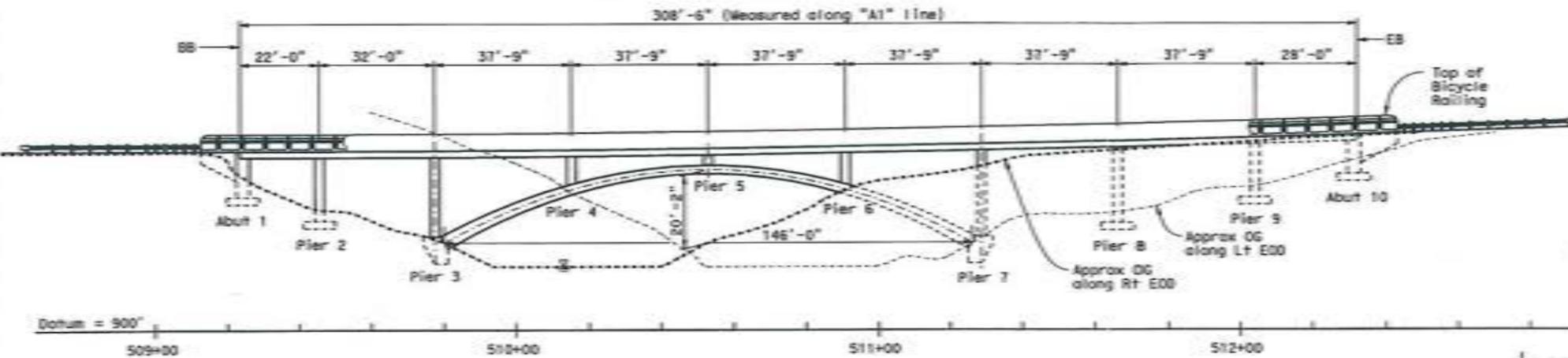
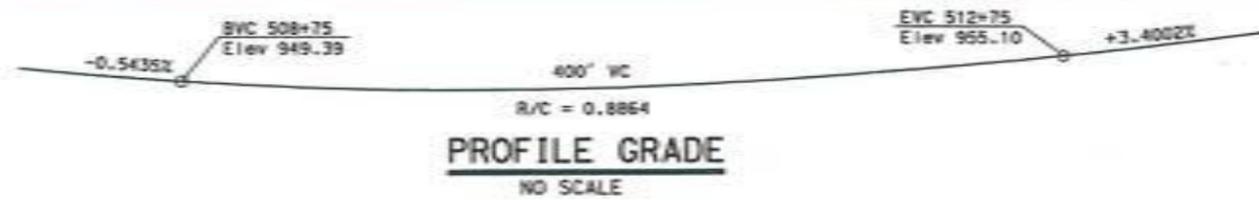


Bridge Profile Drawings for Patrick Creek Location 2

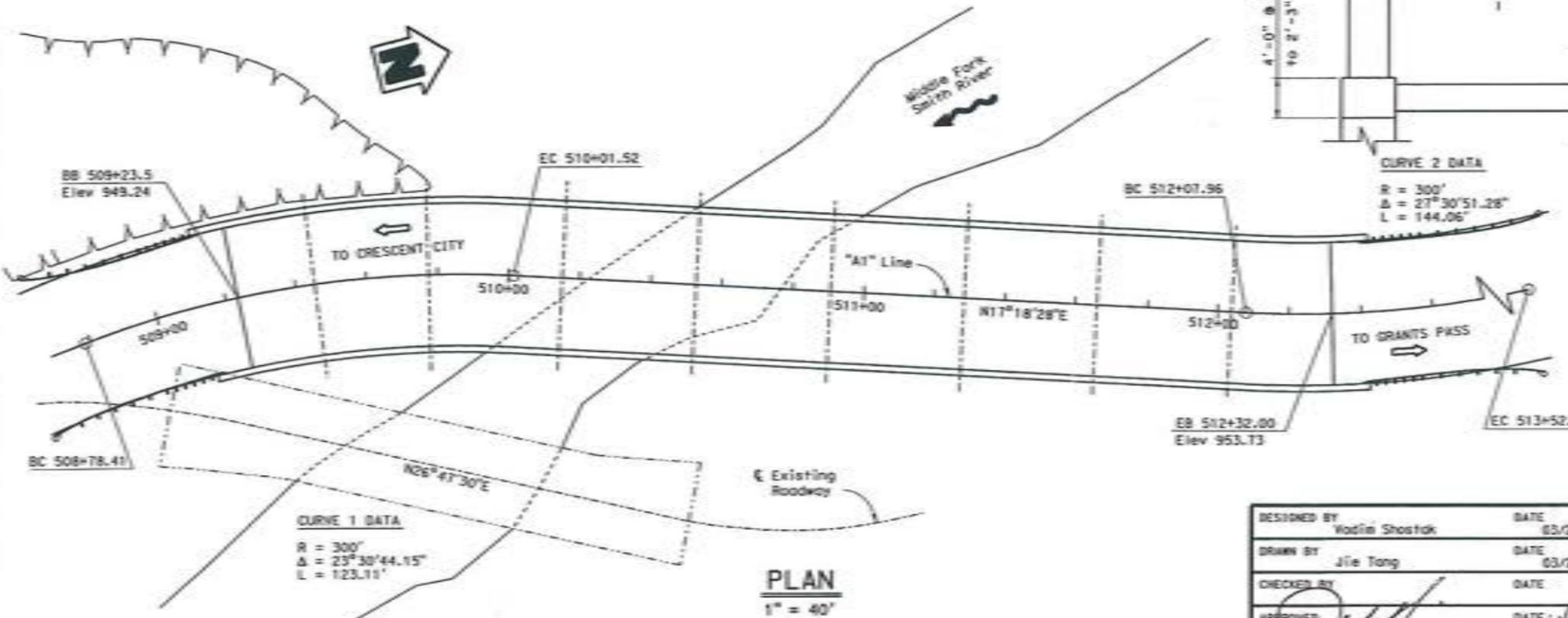
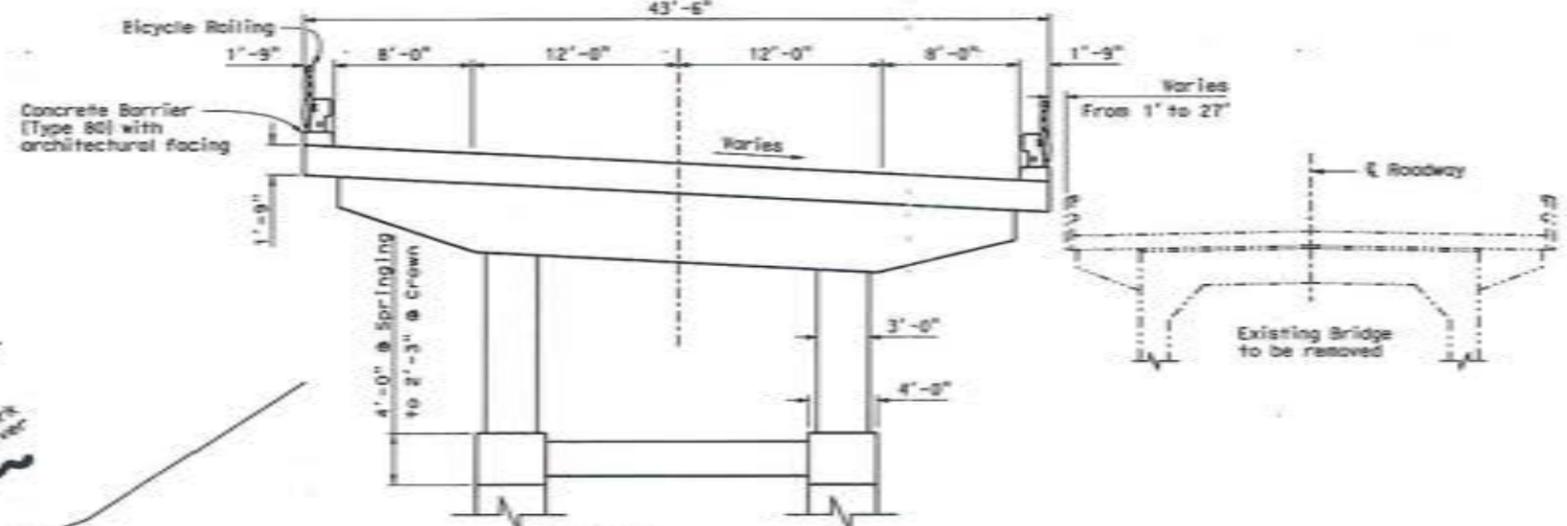


DISC	COUNTY	ROUTE	POST MILE
01	DN	199	24.08

To get to the Caltrans web site, go to: <http://www.dot.ca.gov>



- Notes:
1. Assumed spread footing at abutments and piers.
  2. Assumed short seat abutments 1 & 10 with wingwalls.



Date of Estimate	5/20/09
Str. Depth	1'-9"
Length	308'-6"
Width	43'-6"
Area	13,420 ft <sup>2</sup>
Cost/sq ft including 10% Mobilization & 25% Contingency	\$240/ft <sup>2</sup>
Total Cost	3,224,000
Working Days	PRO

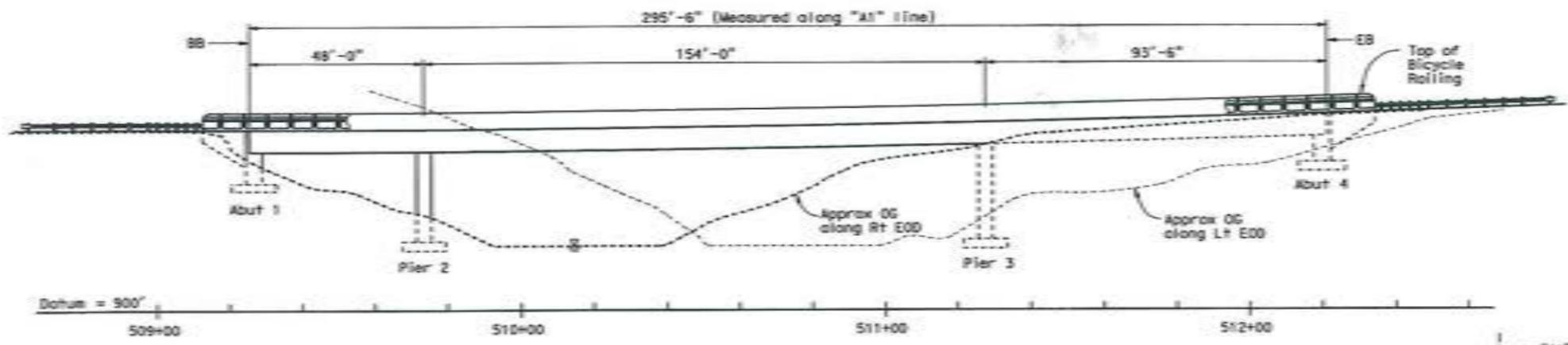
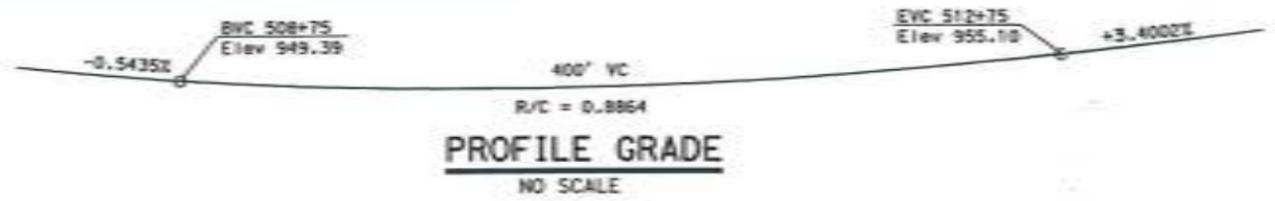
DESIGNED BY Vadim Shostak	DATE 03/25/09
DRAWN BY Jie Tang	DATE 03/25/09
CHECKED BY	DATE
APPROVED <i>[Signature]</i>	DATE 4/17/09

**STRUCTURE DESIGN BRANCH**  
**1**

<b>ALTERNATIVE 1A</b>	
<b>PLANNING STUDY</b>	
<b>SMITH RIVER BRIDGE</b>	
BRIDGE NO. XX	cu 01
SCALE: AS SHOWN	EX 479400

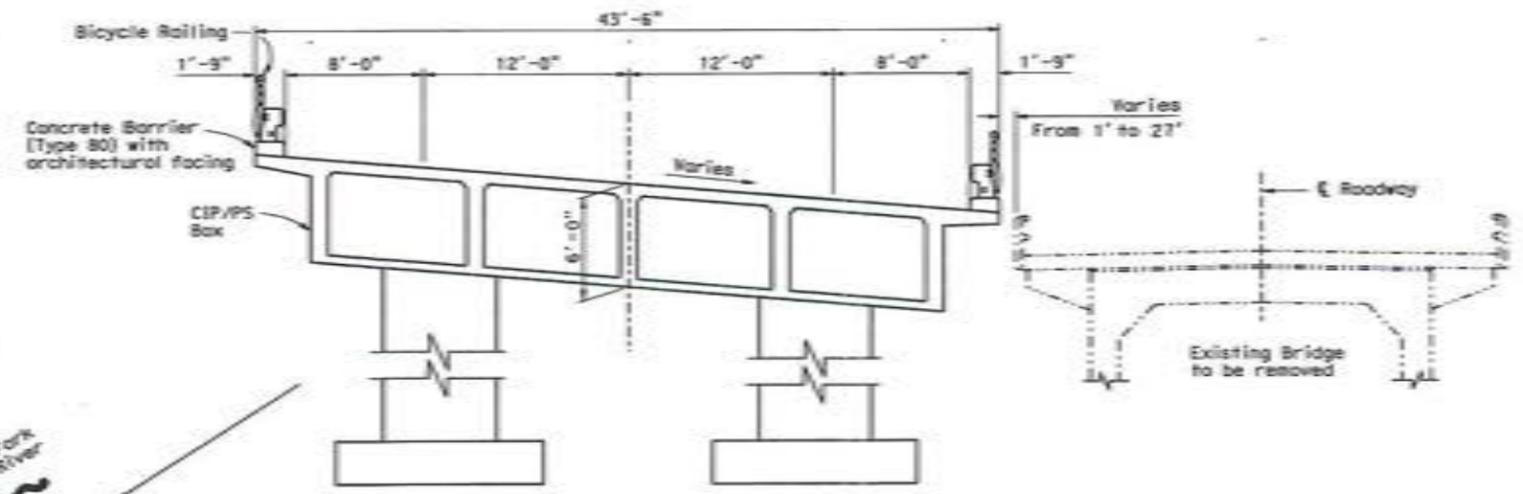
DIST.	COUNTY	ROUTE	POST MILE
01	DN	199	24.08

To get to the Caltrans web site, go to <http://www.dot.ca.gov>



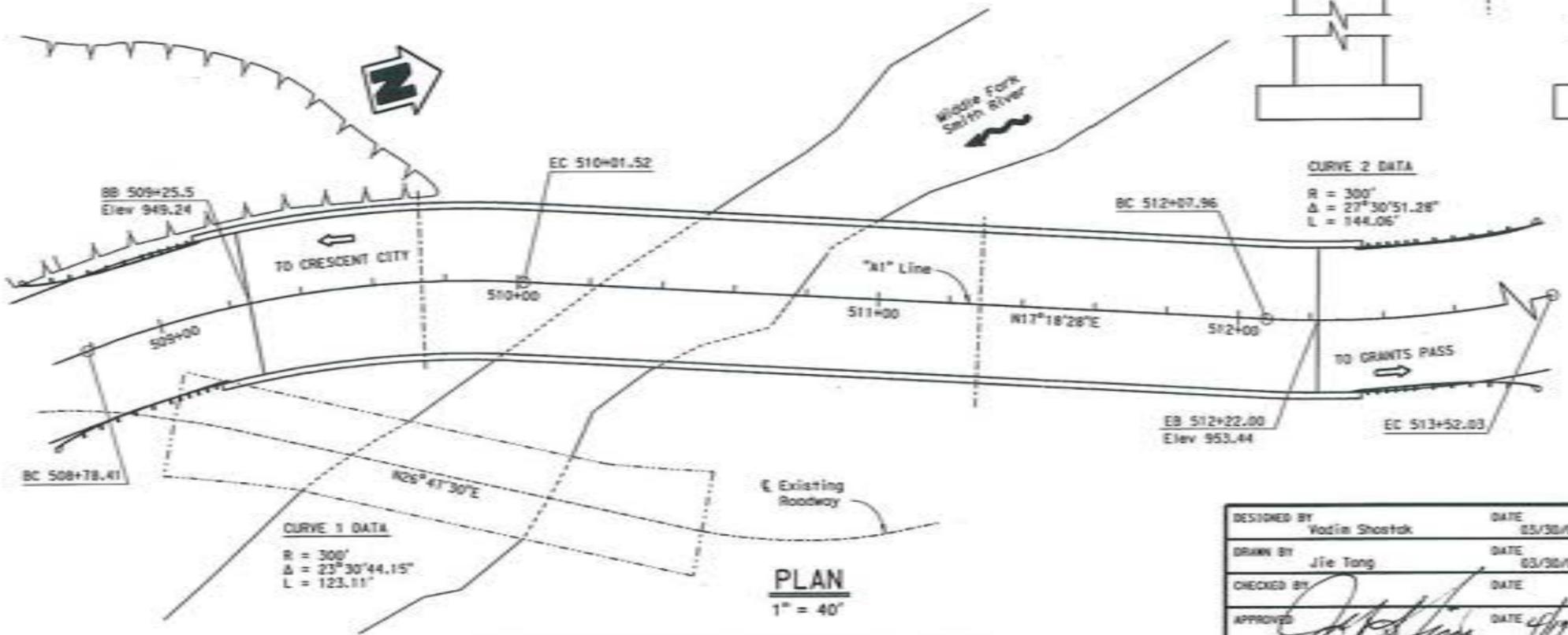
**DEVELOPED ELEVATION**  
1" = 40'

- Notes:
1. Assumed spread footing of abutments and piers.
  2. Assumed short seat abutments 1 & 4 with wingwalls.



**TYPICAL SECTION**  
1/2" = 1'-0"

**CURVE 2 DATA**  
R = 300'  
Δ = 27°30'51.28"  
L = 144.05'



**PLAN**  
1" = 40'

Date of Estimate	5/20/09
Str. Depth	6'-0"
Length	295'-6"
Width	43'-6"
Area	12,854 ft <sup>2</sup>
Cost/sq ft including 10% Mobilization & 25% Contingency	\$231/sq ft
Total Cost	\$3,071,000
Working Days	170

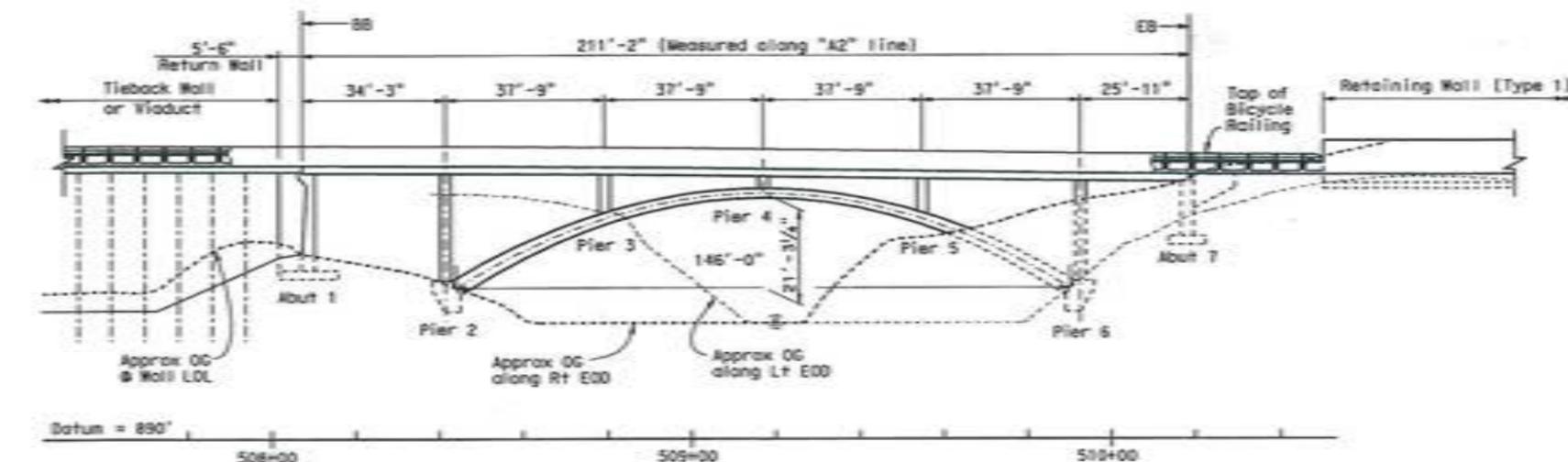
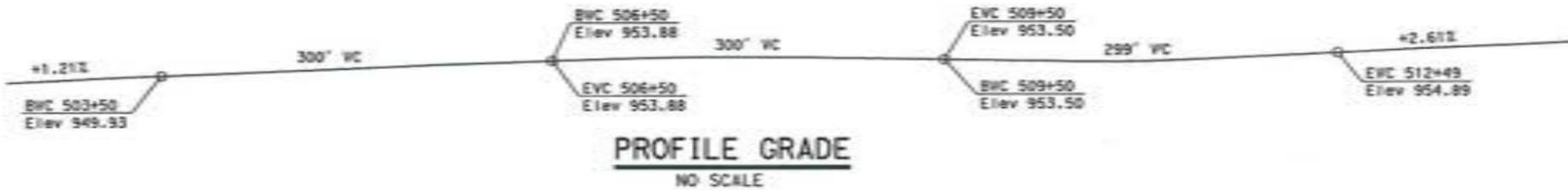
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DRAWN BY	Jie Tang	DATE	03/30/09
CHECKED BY		DATE	
APPROVED	<i>[Signature]</i>	DATE	4/19/09

**STRUCTURE DESIGN BRANCH**  
**1**

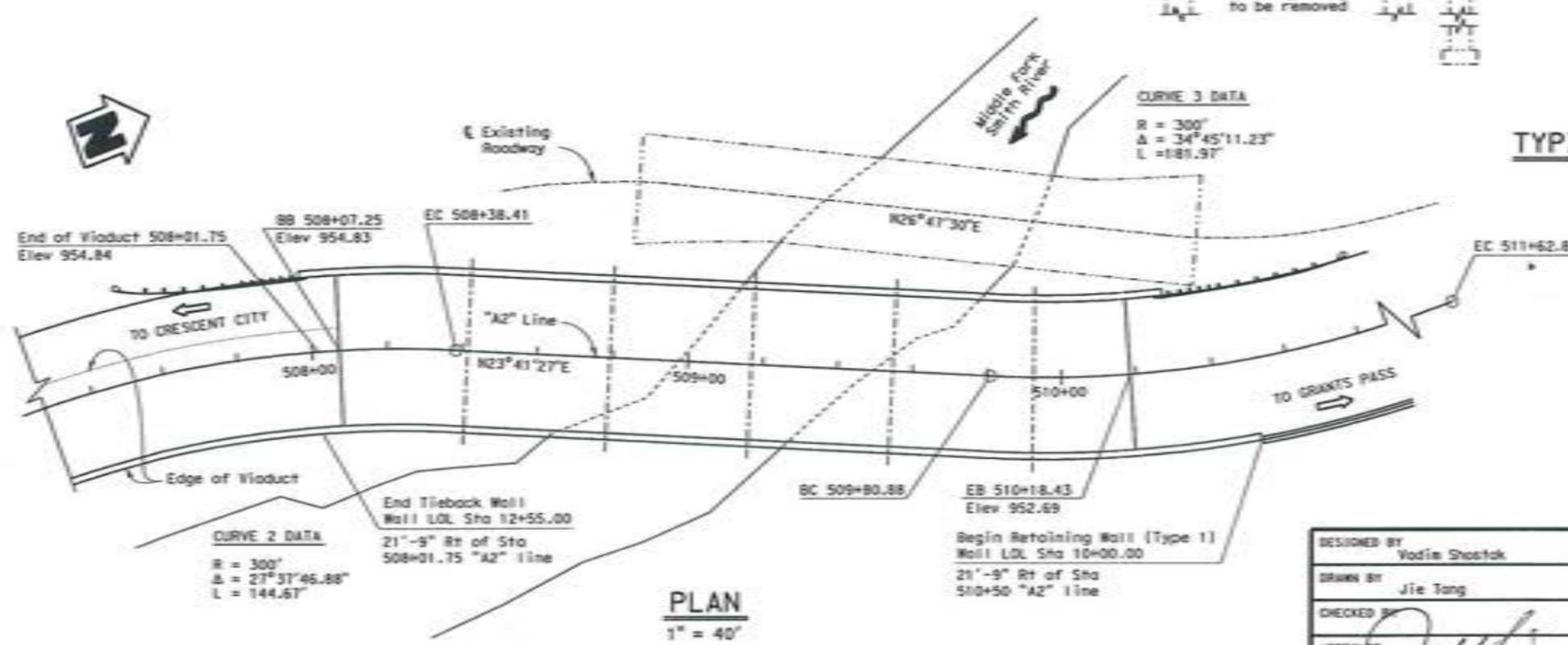
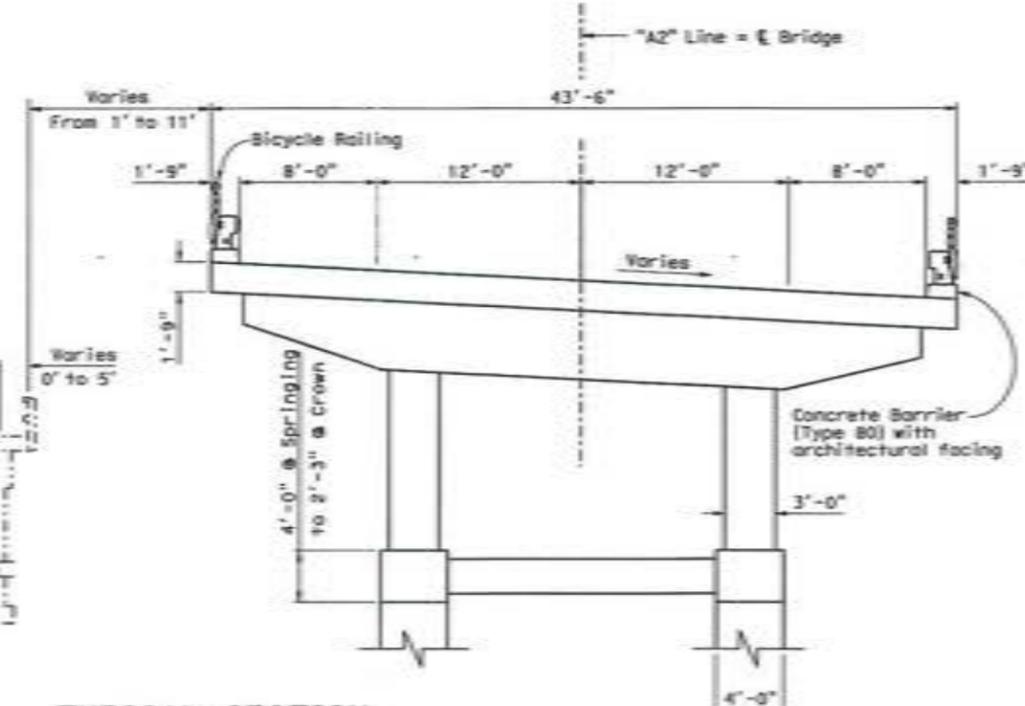
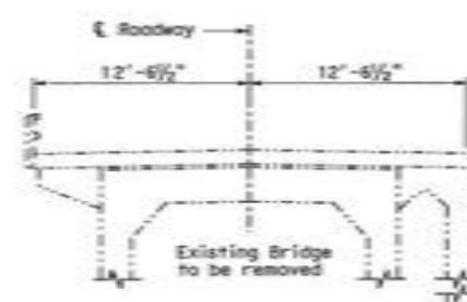
<b>ALTERNATIVE 1B</b>	
<b>PLANNING STUDY</b>	
<b>SMITH RIVER BRIDGE</b>	
BRIDGE NO. XX	CD 01
SCALE: AS SHOWN	EA 479400

DIST.	COUNTY	ROUTE	POST MILE
01	DN	199	24.08

To get to the address web site, go to: <http://www.dot.ca.gov>



- Notes:
1. Assumed spread footing at abutments and piers.
  2. Assumed high cantilever abutment 1 and short seat abutment 7 with wingwalls.



Date of Estimate	5/22/09
Str. Depth	1'-9"
Length	211'-2"
Width	43'-6"
Area	9,186 ft <sup>2</sup>
Cost/sq ft including 10% Mobilization & 25% Contingency	\$280/sq ft
Total Cost	\$2,665,000
Working Days	175

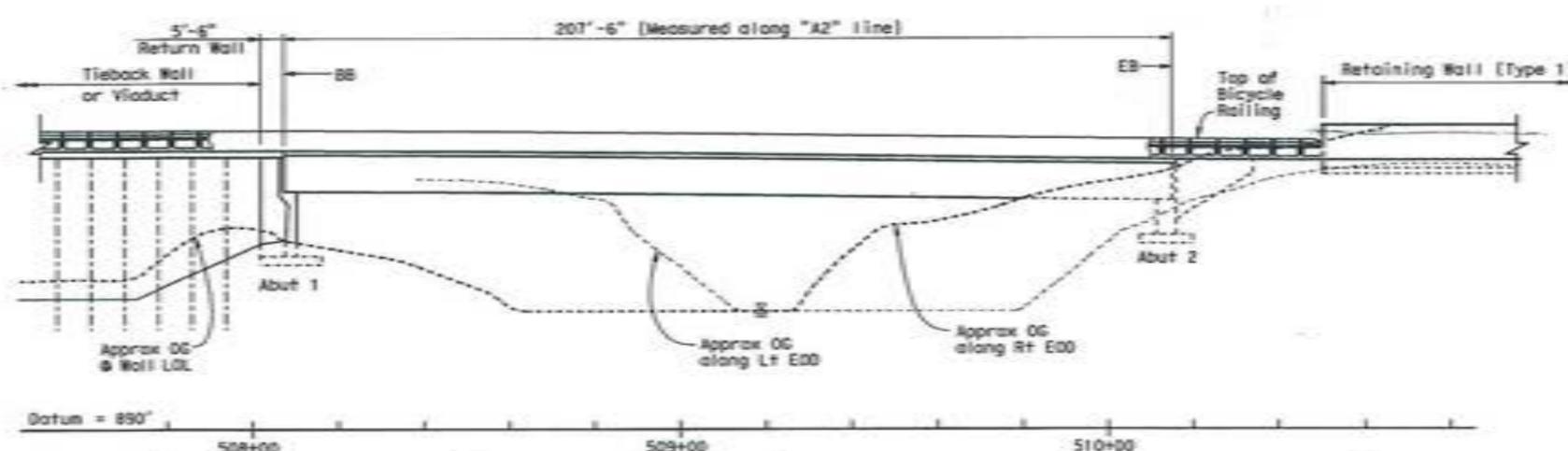
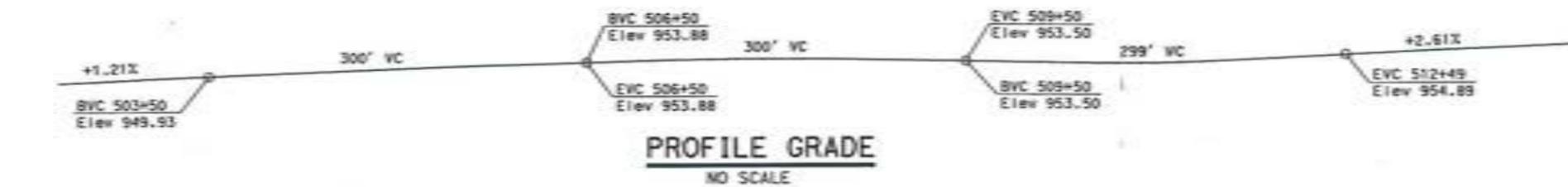
DESIGNED BY	Vodie Shostak	DATE	03/19/09
DRAWN BY	Jie Tang	DATE	03/19/09
CHECKED BY		DATE	
APPROVED	<i>[Signature]</i>	DATE	4/1/09

STRUCTURE DESIGN BRANCH  
**1**

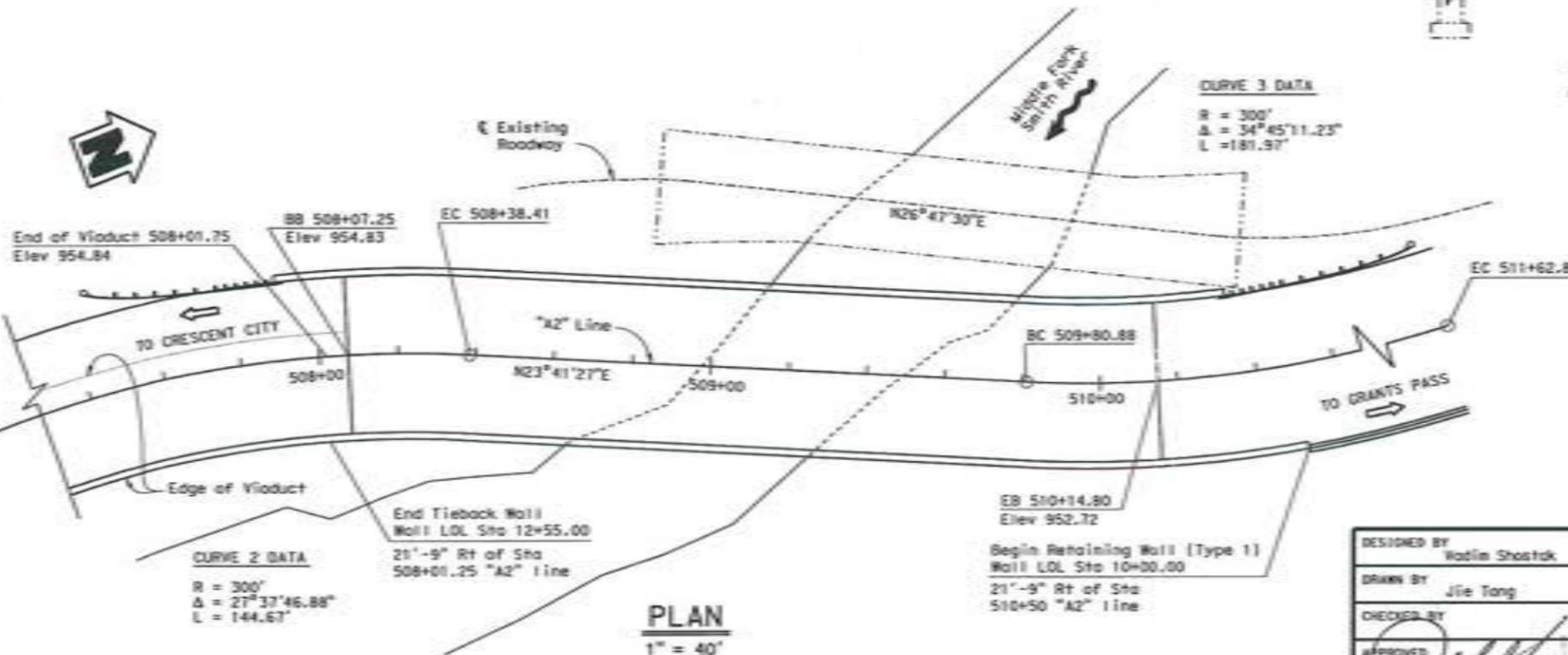
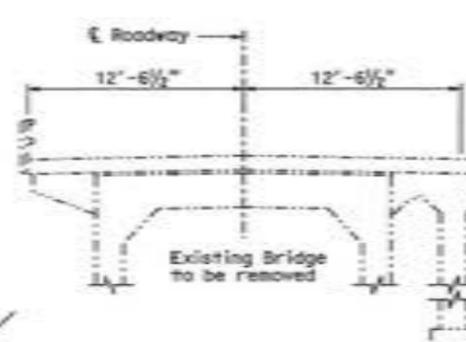
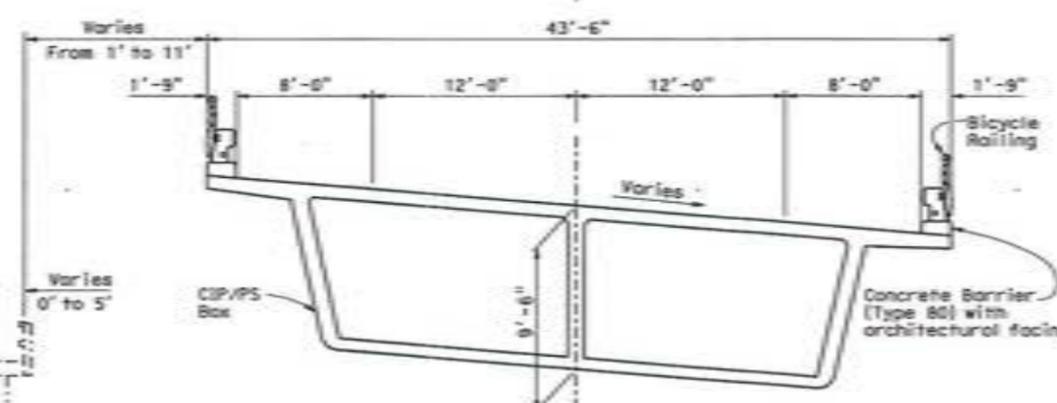
ALTERNATIVE 2A	
PLANNING STUDY	
SMITH RIVER BRIDGE	
BRIDGE NO. XX	CU 01
SCALE: AS SHOWN	EA 479400

DIST.	COUNTY	ROUTE	POST MILE
01	DN	199	24.08

To get to the Caltrans web site, go to: <http://www.dot.ca.gov>



- Notes:
1. Assumed spread footing at abutments.
  2. Assumed high cantilever abutment 1 and short seat abutment 2 with wingwalls.



Date of Estimate	5/22/2009
Str. Depth	9'-6"
Length	201'-6"
Width	43'-6"
Area	3,026 ft <sup>2</sup>
Cost/sq ft including 10% Mobilization & 25% Contingency	\$255/ft <sup>2</sup>
Total Cost	\$2402,000
Working Days	155

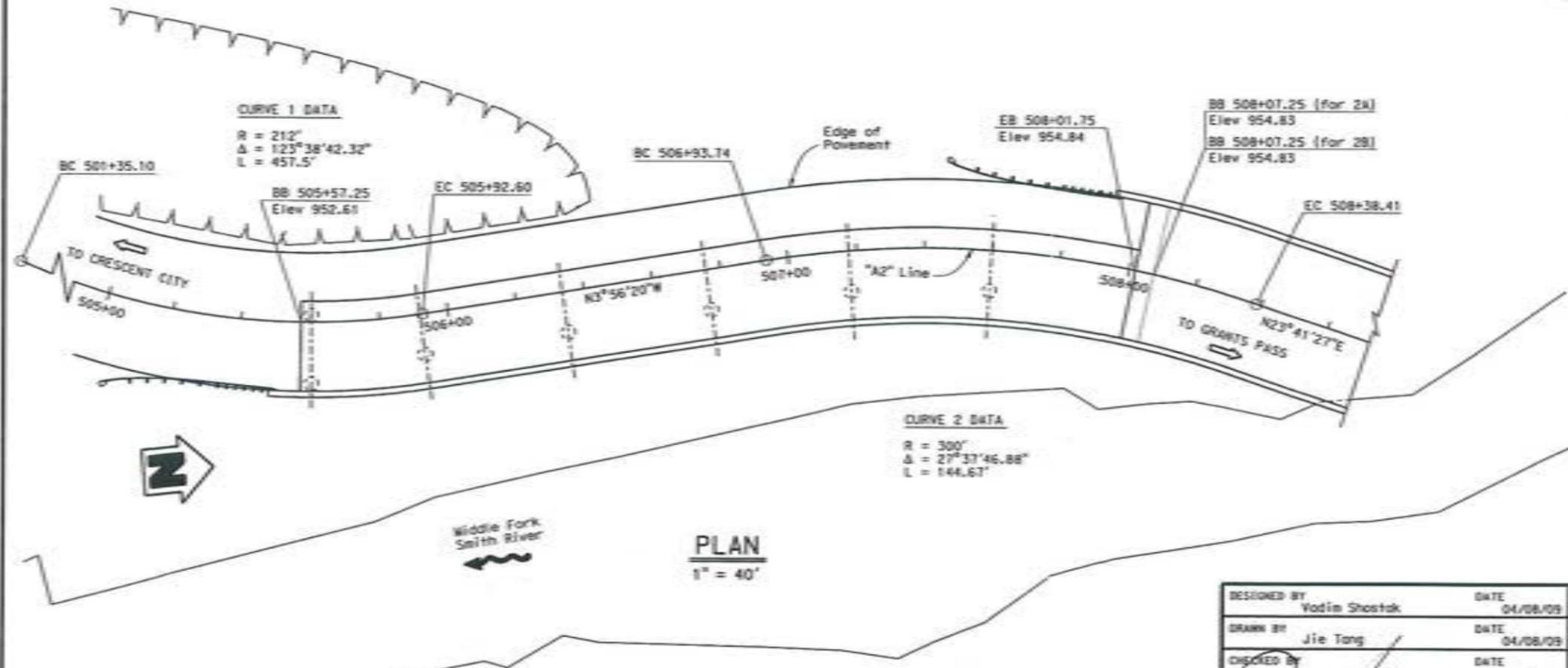
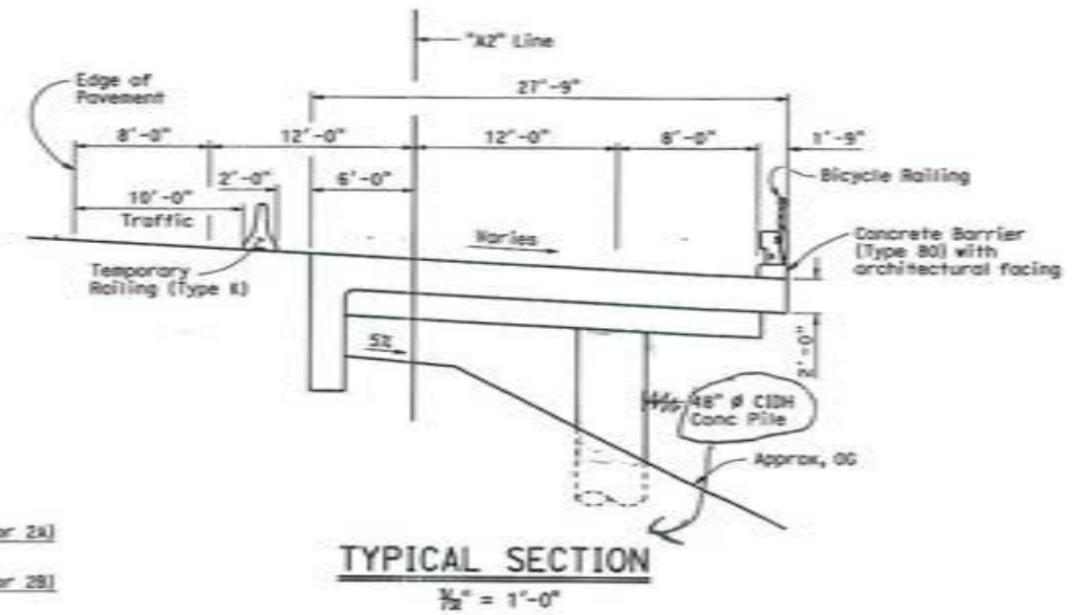
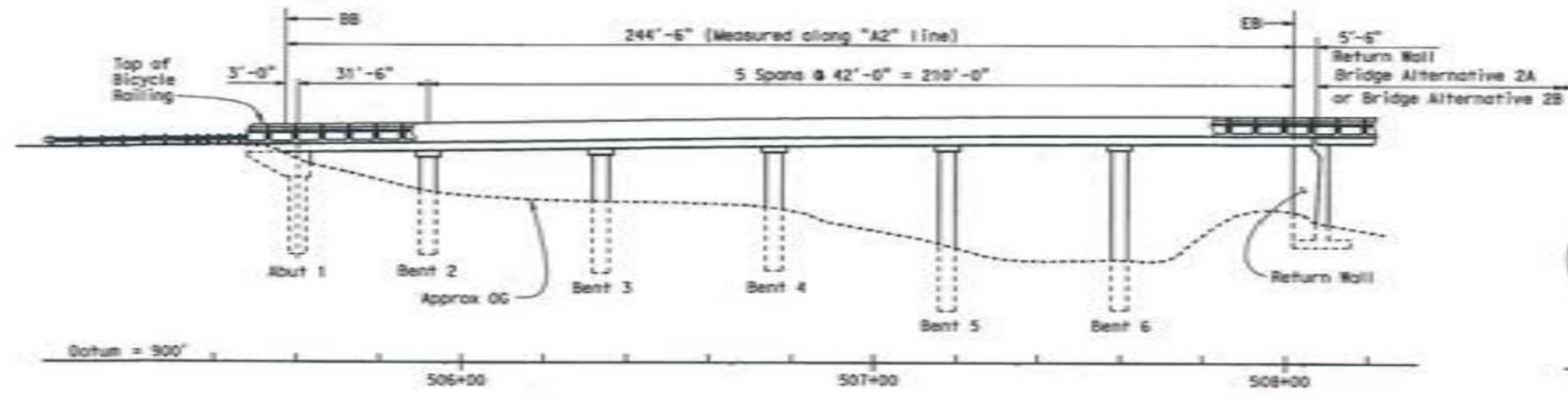
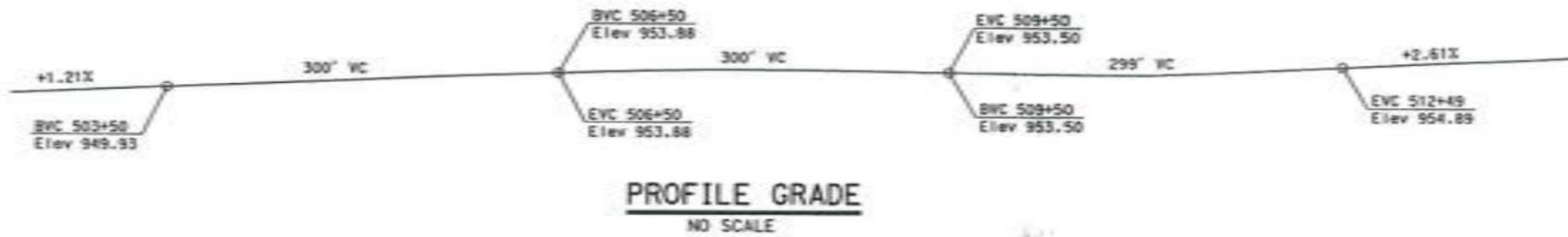
DESIGNED BY	Wladimir Shostak	DATE	03/24/09
DRAWN BY	Jill Tong	DATE	03/24/09
CHECKED BY		DATE	
APPROVED	<i>[Signature]</i>	DATE	4/1/09

STRUCTURE DESIGN BRANCH  
**1**

ALTERNATIVE 2B	
PLANNING STUDY	
SMITH RIVER BRIDGE	
BRIDGE NO. XX	01
SCALE: AS SHOWN	EA 479400

DIST.	COUNTY	ROUTE	POST MILE
01	DN	199	24.08

To get to the Caltrans web site, go to <http://www.dot.ca.gov>



Date of Estimate	5/20/2009
Str. Depth	2'-0"
Length	244'-6"
Width	27'-9"
Area	6,785 ft <sup>2</sup>
Cost/sq ft including 10% Mobilization & 25% Contingency	\$267/ft <sup>2</sup>
Total Cost	\$1,808,000
Working Days	135

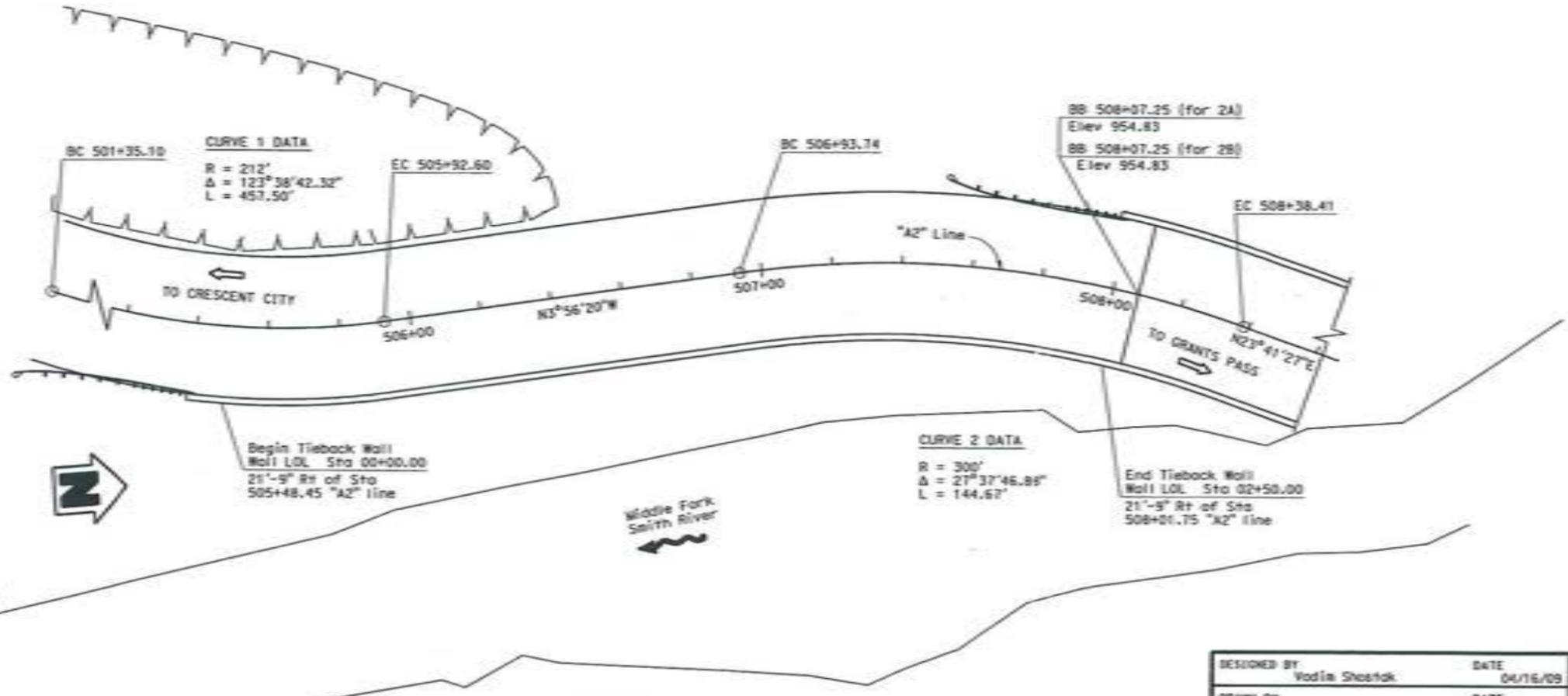
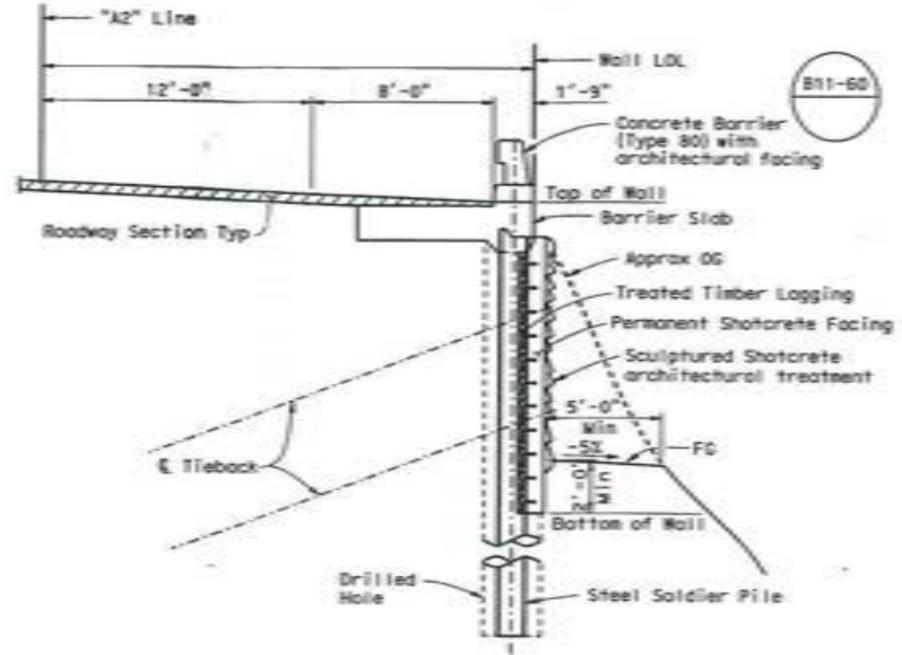
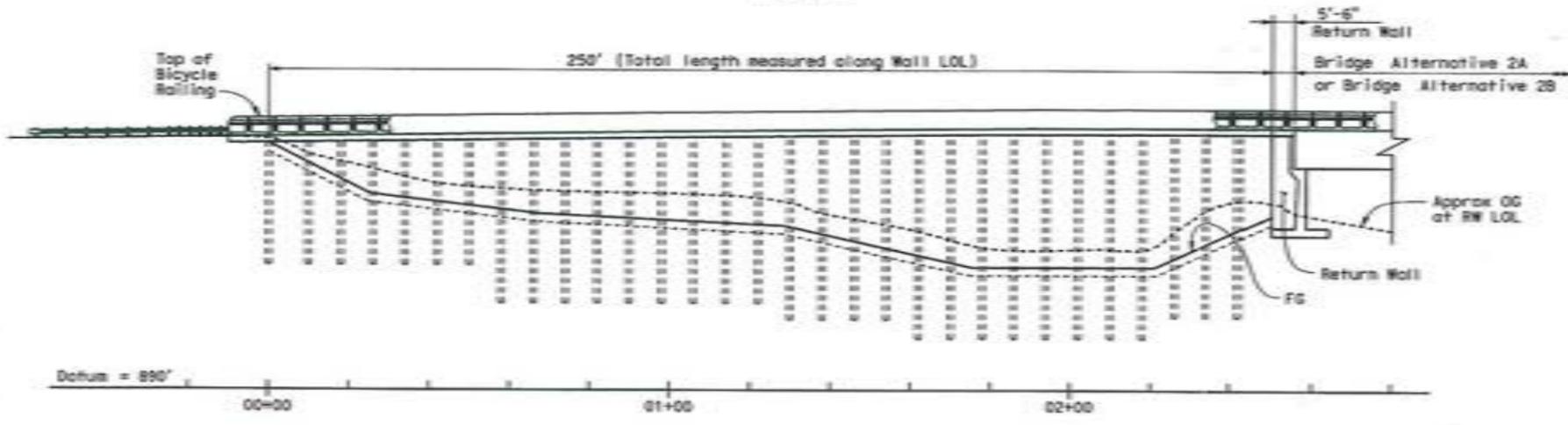
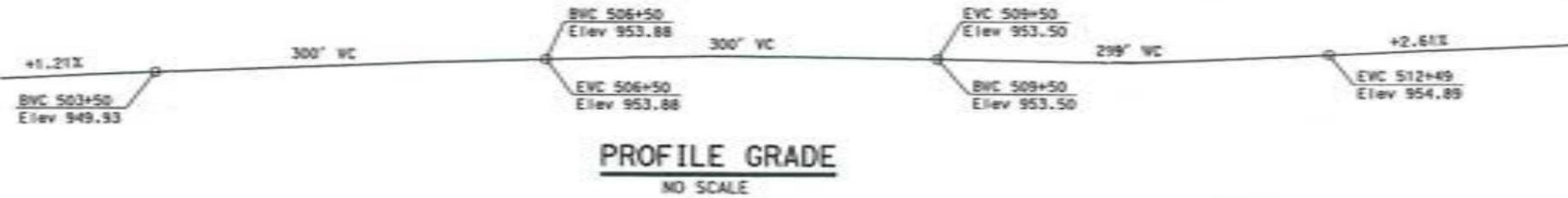
DESIGNED BY	Yodim Shostak	DATE	04/08/09
DRAWN BY	Jie Tang	DATE	04/08/09
CHECKED BY		DATE	
APPROVED	<i>[Signature]</i>	DATE	4/17/09

**STRUCTURE DESIGN BRANCH 1**

ALTERNATIVE VIADUCT FOR 2A & 2B	
<b>PLANNING STUDY</b>	
<b>SMITH RIVER BRIDGE</b>	
BRIDGE NO. XX	CU 01
SCALE: AS SHOWN	EA 479-400

DIST.	COUNTY	ROUTE	POST MILE
01	DM	199	24.08

To get to the Caltrans web site, go to <http://www.dot.ca.gov>



Date of Estimate	5/20/2009
Str. Depth	N/A
Length	250'-0"
Width	N/A
Area	N/A
Cost/sq ft including	
10% Mobilization &	
25% Contingency	N/A
Total Cost	\$1,628,000
Working Days	85

DESIGNED BY	Vadim Shostak	DATE	04/16/09
DRAWN BY	Jie Tang	DATE	04/16/09
CHECKED BY		DATE	
APPROVED	<i>[Signature]</i>	DATE	4/19/09

**STRUCTURE DESIGN BRANCH**  
**1**

ALTERNATIVE TIEBACK WALL FOR 2A & 2B	
<b>PLANNING STUDY</b>	
<b>SMITH RIVER BRIDGE</b>	
BRIDGE NO. XX	CU 01
SCALE: AS SHOWN	EA 479400

# Artist Renderings for Bridge at Patrick Creek Location 2

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MIDDLE FORK SMITH RIVER BRIDGE (REPLACEMENT)  
PERSPECTIVE VIEW  
LOOKING WEST

Prepared by Structure Design Services - Bridge Architecture and Aesthetics

DESIGN BY: JUAN DIAZ  
DESIGN NO.: 121184TH  
DATE: 6-2-2018



Appendix R Draft Enhanced Erosion Control  
Seeding and Revegetation Plan

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# Appendix R Draft Enhanced Erosion Control Seeding and Revegetation Plan for the 197/199 Safe STAA Access Project

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The Department, or its contractor, would adhere to the following measures to implement the permanent enhanced erosion control seeding and revegetation for the proposed project.

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. The purpose of using enhanced erosion control seeding is to help re-establish the local 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. It would also 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.

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. Following are anticipated customized seed mixes.

**Anticipated customized seed mixes for each location in the 197/199 Safe STAA Access project**

Project Location	Habitat for which the Customized Seed Mix will be developed
SR 197 Locations	Coast redwood forest understory and openings
US 199 Locations	Douglas-fir/ponderosa pine forest openings, including rocky, steep, dry habitats

- Seed Collection**—Seeds will be collected in the vicinity of each project location within the highway corridor, or on adjacent property with landowner permission. Seeds will be gathered from natural communities having similar plant species composition and abiotic characteristics (e.g., similar soil type, canopy cover, moisture regime, aspect, etc.) within Del Norte County. Species to be included in a seed mix and quantity of each species would be determined by what was available (under collection guidelines) within the area at the time of collection. Seed collection will focus on collecting seed of early successional or pioneer native species but will also include some slower growing and/or later successional species. The potential seeding species to be collected are the native species listed by occurrence at each location, in Appendix N. A botanist, plant ecologist, or qualified staff with knowledge of flora of the SR 197 and US 199 region will oversee the collection activities. Seed

collection would occur several times during the growing season to capture seeds from early to late blooming species prior to the anticipated completion of construction at a given location. Seed collection would be conducted in accordance with the *General Seed Collection Guidelines For California Native Plant Species* developed by the Rancho Santa Ana Botanic Garden (<http://www.rsabg.org/>).

- **Collection Permit**—An encroachment permit for the seed collection in the Caltrans right-of-way may be needed if collection is not done with in-house staff. A collection permit would be needed from the US Forest Service for any seed collection on US Forest Service property. In addition, any seed collection on private property would require approval by the property owner.
- **Preparation for Seed Collection**—During the year that seed will be collected for a given location or seed mix, a botanist, plant ecologist, or qualified staff with knowledge of flora of the SR 197 and US 199 region will conduct site visits to determine species maturity, availability, and abundance. Presence of available species for seed collection will be recorded in field notes and by photograph, and the general location of species will be mapped to a level of detail to allow future collectors to relocate the species.
- **Supplemental Seed**—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. Alternatively, depending on the quantity of native seed collected, the botanist, revegetation specialist, landscape architect, or staff with similar qualifications may reduce the amount of ordered seed based on collection results.
- **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 (inland 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 will 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.
- **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, if feasible, to de-compact soils and facilitate revegetation prior to topsoil/duff application and seeding/revegetation.
- **Invasives**—No invasive plant species would be used at any location. During the three-year 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).

- **Implementation Schedule**—Permanent enhanced erosion control seeding will be hydroseeded after the last soil-disturbing activities at a location are complete, or prior to end of construction. Revegetation will be implemented during the first full planting season (November to March) to prevent impacts to erosion control seeding germination and establishment, and after the first seasonal rains have saturated soils beyond the first several inches.
- **Monitoring of Enhanced Erosion Control**—Enhanced erosion control seeding would be monitored for two years, starting approximately one year after hydroseeding and preferably during the blooming season. There would be three monitoring success criteria: a minimum of approximately 20% absolute cover<sup>1</sup> (except rock faces) along road shoulders, a minimum of approximately 1 to 5% absolute cover on steep slopes, 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.
- **Watering**—Container plants will be deep-watered immediately after planting (i.e., soils will be saturated beyond the first several inches) and mulched. Subsequent watering of the

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<sup>1</sup> “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](http://www.cnps.org/cnps/vegetation/pdf/1_CNPS_TableMtn_Final_Report.pdf) on 8/4/12.)

container plants via a water truck filled from commercial water sources will be conducted as directed by the botanist, plant ecologist, biologist, revegetation specialist, landscape architect, or similarly qualified staff. Watering will occur during any extensive dry period during the first month after planting, and approximately weekly during the first two years following planting (May through September). Plants are anticipated to be established after the second year of watering, so watering is not anticipated to be needed after the second year of watering.

## Appendix S List of Technical Studies

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# Appendix S List of Technical Studies

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## **Human Environment**

- Community Impact Assessment and addendum (Trott 2010)
- Historic Property Survey Report, Including Archaeological Survey Report (ICF International 2010a and 2010b)
- Resources Evaluated Relative to the Requirements of Section 4(f) (Appendix B of this EIR/EA)
- Visual Impact Assessment and addendum (ICF International 2010)

## **Physical Environment**

- Air Quality Study Report (ICF International 2010)
- Noise Study Report and addendum (ICF International 2010)
- Traffic Analysis Report (Fehr & Peers 2010)
- Water Quality Report (California Department of Transportation 2010)

## **Floodplains/Drainage**

- Draft Drainage Report for Ruby 1 (California Department of Transportation 2007a)
- Draft Drainage Report for Ruby 2 (California Department of Transportation 2008b)

## **Geotechnical Reports**

- Preliminary Geotechnical Report for Ruby 2 (California Department of Transportation 2008)
- Preliminary Geotechnical Report for Patrick Creek Narrows Locations 1 to 3 (California Department of Transportation 2009a)
- Structure Preliminary Geotechnical Report and Preliminary Seismic Report for Patrick Creek Narrows Location 2 (California Department of Transportation 2009b)
- Advanced Planning Study Transmittal for Patrick Creek Narrows Locations 1 to 3 (California Department of Transportation 2009c)
- Preliminary Geotechnical Report for The Narrows (California Department of Transportation 2009d)
- Preliminary Geotechnical Report for Washington Curve (California Department of Transportation 2009e)

### **ADL, NOA, and LCP Site Investigations**

- ADL Site Investigation Report for Ruby 1 (Geocon Consultants, Inc. 2008a)
- Transmittal Memorandum of an ADL Site Investigation Report for Ruby 1 (Werner 2008a)
- ADL Site Investigation Report for Ruby 2 (Geocon Consultants, Inc. 2008b)
- NOA Site Investigation Report for Patrick Creek Narrows Location 1 (Geocon Consultants, Inc. 2008c)
- Transmittal Memorandum of NOA Site Investigation Report for Patrick Creek Narrows Location 1 (Werner 2008c)
- Asbestos and Lead-Containing Paint Survey Report for Patrick Creek Narrows Location 2 (Geocon Consultants, Inc. 2009)
- Revised NOA Disposal Requirements for Patrick Creek Narrows Location 1 (Werner 2009a)
- ADL and NOA Site Investigation Report for Washington Curve (Geocon Consultants 2009b)

### **Initial Site Assessments**

- ISA for Ruby 1 (Werner 2007a)
- ISA and Transmittal Memorandum of an ADL Site Investigation Report for Ruby 2 (Werner 2008b)
- ISA for Patrick Creek Narrows Locations 1 to 3 (Werner 2007b)
- ISA for The Narrows (Werner 2005)
- ISA for The Narrows—Follow-Up Memorandum (Werner 2009b)
- ISA for Washington Curve (Werner 2008d)
- ISA for Washington Curve—revised (Werner 2009c)
- ISA for Washington Curve—revised (Werner 2010)

### **Biological Environment**

- Natural Environment Study (California Department of Transportation 2010), including the following attachments:
  - Memorandum regarding Results of Bat Surveys (ICF International 2009)
  - Cryptogamic Survey Report (ICF International 2010)
  - Delineation of Wetlands and Other Waters for Ruby 1, Ruby 2, and The Narrows (ICF International 2010)
  - Delineation of Wetlands and Other Waters for Patrick Creek Narrows locations and Washington Curve (California Department of Transportation 2010)

- Noise Impacts on Fish and Birds (ICF International 2010)
- Special-Status Plants Survey Report (ICF International 2010)
- Tree Survey Report (ICF International 2010)
- Biological Memo: Addendum to the Natural Environment Study, 197/199 Safe STAA Access Project (California Department of Transportation 2012)
- Arborist/Forester Report, 197/199 Safe STAA Access Project (Gaman, T. and R. Moritz 2012)
- Biological Assessment, 197/199 Safe STAA Access Project (California Department of Transportation 2012)