

DRAFT

**INITIAL STUDY
MITIGATED NEGATIVE DECLARATION**

**BIG RIVER WATERSHED RESTORATION
PROPOSITION 40 – RIVER PARKWAYS GRANT
PROJECT**



June 2006



State of California
DEPARTMENT OF PARKS AND RECREATION

MITIGATED NEGATIVE DECLARATION

PROJECT: BIG RIVER WATERSHED RESTORATION, PROPOSITION 40 RIVER PARKWAYS GRANT PROJECT

LEAD AGENCY: California Department of Parks and Recreation

AVAILABILITY OF DOCUMENTS: The Initial Study for this Mitigated Negative Declaration is available for review at:

- Mendocino District Headquarters
California Department of Parks & Recreation
State Hwy. 1, Russian Gulch State Park
Mendocino, CA 95460
- Mendocino County Library, Fort Bragg Branch
499 Laurel Street Fort Bragg, California 95437
- Northern Service Center
California Department of Parks and Recreation
One Capitol Mall, Suite 410
Sacramento, CA 95814
- California Department of Parks and Recreation website
www.parks.ca.gov/default.asp?page_id=981

PROJECT DESCRIPTION:

The California Department of Parks and Recreation (DPR) proposes to correct erosion and sedimentation problems, improve stream crossings along roads, remove logging roads that contribute sediment to Big River and tributaries, convert roads to trails, restore pre-disturbance hydrologic processes, delineate parking areas, construct a restroom building, and improve public information within the Big River unit of Mendocino Headlands State Park. Goals of this project include road de-commissioning and conversion into recreational trails, stabilizing or removing skidtrails and landings to restore riverine functions, improving fish passage and opening up new habitat for spawning and rearing, resurfacing and delineating parking locations, and constructing public toilets. Work related to these efforts will include:

- Excavation and removal of road fill from stream channels to re-establish historical width, depth, alignment, and gradient;
- Removal of sidecast fill material along roadsides;
- Decompaction of road surfaces to facilitate revegetation by native plants;
- Retrieval and removal of debris (culverts, cable, concrete foundations, etc.) that negatively affect hydrologic processes and natural habitats;
- Restoration of the natural topography and hydrology of the land (ridges, stream valleys and swales) along roadway corridors;

- Removal of non-native invasive plant species;
- Mulching and implementation of other stabilization techniques in disturbed sites using woody debris recovered from excavations;
- Monitoring and maintenance of disturbed areas to improve conditions for either human-assisted or natural revegetation with native species;
- Delineation of beach parking areas with boulders, logs, or other natural material;
- Resurfacing of the beach parking areas and primary road with compacted road base;
- Installation of a vault restroom facility outside the 100-year floodplain;
- Installing regulatory, informational, and interpretive signs pertaining to restoration efforts.

Specific watershed restoration activities will focus on eleven sites scattered throughout the Big River unit, with the parking area and restroom work comprising a twelfth site.

A copy of the Initial Study is attached. Questions or comments regarding this Initial Study/Mitigated Negative Declaration may be addressed to:

California Department of Parks & Recreation

Pursuant to Section 21082.1 of the California Environmental Quality Act, the California Department of Parks and Recreation (DPR) has independently reviewed and analyzed the Initial Study and Negative Declaration for the proposed project and finds that these documents reflect the independent judgment of DPR. DPR, as lead agency, also confirms that the project mitigation measures detailed in these documents are feasible and will be implemented as stated in the Negative Declaration.

_____ ORIGINAL SIGNATURE ON FILE _____
 Kirk Marshal
 Acting District Superintendent

 Date

_____ ORIGINAL SIGNATURE ON FILE _____
 Renée Pasquinnelli
 Environmental Coordinator

 Date

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CHAPTER 1 INTRODUCTION

1.1 INTRODUCTION AND REGULATORY GUIDANCE

The Initial Study/Mitigated Negative Declaration (IS/MND) has been prepared by the California Department of Parks and Recreation (DPR) to evaluate the potential environmental effects of the proposed Big River Watershed Restoration, Proposition 40 – River Parkways Grant Project at the Big River unit of Mendocino Headlands State Park, Mendocino County, California. This document has been prepared in accordance with the California Environmental Quality Act (CEQA), Public Resources Code §21000 *et seq.*, and the State CEQA Guidelines, California Code of Regulations (CCR) §15000 *et seq.*

An Initial Study is conducted by a lead agency to determine if a project may have a significant effect on the environment [CEQA Guidelines §15063(a)]. If there is substantial evidence that a project may have a significant effect on the environment, an Environmental Impact Report (EIR) must be prepared, in accordance with CEQA Guidelines §15064(a). However, if the lead agency determines that revisions in the project plans or proposals made by or agreed to by the applicant mitigate the potentially significant effects to a less-than-significant level, a Mitigated Negative Declaration may be prepared instead of an EIR [CEQA Guidelines §15070(b)]. The lead agency prepares a written statement describing the reasons a proposed project would not have a significant effect on the environment and, therefore, why an EIR need not be prepared. This IS/MND conforms to the content requirements under CEQA Guidelines §15071.

1.2 LEAD AGENCY

The lead agency is the public agency with primary approval authority over the proposed project. In accordance with CEQA Guidelines §15051(b)(1), "the lead agency will normally be an agency with general governmental powers, such as a city or county, rather than an agency with a single or limited purpose." The lead agency for the proposed project is DPR. The contact person for the lead agency is:

Renée Pasquinelli, Senior Environmental Scientist
Email: rpasquinelli@parks.ca.gov

All inquiries regarding environmental compliance for this project, including comments on this environmental document should be addressed to:

Renée Pasquinelli, Senior Environmental Scientist
California Department of Parks & Recreation
Mendocino District
P. O. Box 440
Mendocino, CA 95460-0440
Fax: (707) 937-2953
Email: rpasquinelli@parks.ca.gov

1.3 PURPOSE AND DOCUMENT ORGANIZATION

The purpose of this document is to evaluate the potential environmental effects of the proposed Big River Watershed Restoration, Proposition 40 – River Parkways Grant Project at Mendocino Headlands State Park. Mitigation measures have also been incorporated into the project to eliminate any potentially significant impacts or reduce them to a less-than-significant level.

This document is organized as follows:

- Chapter 1 - Introduction.
This chapter provides an introduction to the project and describes the purpose and organization of this document.
- Chapter 2 - Project Description.
This chapter describes the reasons for the project, scope of the project, and project objectives.
- Chapter 3 - Environmental Setting, Impacts, and Mitigation Measures.
This chapter identifies the significance of potential environmental impacts, explains the environmental setting for each environmental issue, and evaluates the potential impacts identified in the CEQA Environmental (Initial Study) Checklist. Mitigation measures are incorporated, where appropriate, to reduce potentially significant impacts to a less-than-significant level.
- Chapter 4 - Mandatory Findings of Significance
This chapter identifies and summarizes the overall significance of any potential impacts to natural and cultural resources, cumulative impacts, and impact to humans, as identified in the Initial Study.
- Chapter 5 - Summary of Mitigation Measures.
This chapter summarizes the mitigation measures incorporated into the project as a result of the Initial Study.
- Chapter 6 - References.
This chapter identifies the references and sources used in the preparation of this IS/MND. It also provides a list of those involved in the preparation of this document.
- Chapter 7 - Report Preparation
This chapter provides a list of those involved in the preparation of this document.

1.4 SUMMARY OF FINDINGS

Chapter 3 of this document contains the Environmental (Initial Study) Checklist that identifies the potential environmental impacts (by environmental issue) and a brief discussion of each impact resulting from implementation of the proposed project.

Based on the Initial Study and supporting environmental analysis provided in this document, the proposed Big River Watershed Restoration, Proposition 40 – River Parkways Grant Project would result in less-than-significant impacts for the following issues: aesthetics, agricultural resources, air quality, biological resources, cultural resources, geology and soils, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation/traffic, and utilities and service systems.

In accordance with §15064(f) of the CEQA Guidelines, a MND shall be prepared if the proposed project will not have a significant effect on the environment after the inclusion of mitigation measures in the project. Based on the available project information and the environmental analysis presented in this document, there is no substantial evidence that, after the incorporation of mitigation measures, the proposed project would have a significant effect on the environment. It is proposed that a Mitigated Negative Declaration be adopted in accordance with the CEQA Guidelines.

CHAPTER 2 PROJECT DESCRIPTION

2.1 INTRODUCTION

This Initial Study/Mitigated Negative Declaration (IS/MND) has been prepared by the California Department of Parks and Recreation (DPR) to evaluate the potential environmental effects of the proposed Big River Watershed Restoration—Proposition 40—River Parkways Grant Project at the Big River unit of Mendocino Headlands State Park, located near the town of Mendocino, Mendocino County, California. The proposed project would replace failing culverts at Class II and Class III stream crossings with bridges, remove accumulated sediments and road fill prisms from stream crossings, construct armored fords at Class II and Class III stream crossings, partially restore historic topography and native vegetation on former logging roads (road de-commissioning), and convert roads to trails. The Project will also delineate parking areas, a boat launch ramp, and driving surfaces within the existing west-end entry area to the Big River unit, accessed from State Highway 1, and construct a vault-type restroom building in the entry area outside the 100-year floodplain. Standard park signs and a Proposition 40 acknowledgement sign will also be installed as part of this project.

This document is not a general plan, as defined in the California Public Resources Code, nor is it preparatory to a general planning document for Mendocino Headlands State Park or the Big River unit. The proposals articulated here represent a series of projects to be implemented for the immediate address of road and culvert failures and resulting erosion and sedimentation difficulties, will not require a permanent investment in park facilities, and will improve wildlife habitat and allow continued visitor use of the affected areas. Although the California Department of Parks and Recreation prepared a “general development plan” for Mendocino Headlands State Park in 1976 (California State Parks 1976), this plan did not include any part of the recently acquired Big River unit. The long time lapse since the approval of the development plan, and its lack of applicability to the current conditions and extensive site complexity of the Big River unit, render it inadequate to address long-term management goals at Big River. Nevertheless, the currently proposed project represents an attempt to manage resources according to the long-term goals of the park unit while not reducing its recreational opportunities.

Primary funding for the project comes from the Proposition 40, River Parkways Grant Program. All work proposed in the Big River Watershed Restoration project description is expected to be completed with the available grant money. If project delays or changes occur due to unforeseen circumstances, appropriate amendments, if needed, will be filed for this Mitigated Negative Declaration.

2.2 PROJECT LOCATION

This project will be implemented completely within the boundaries of the Big River unit of Mendocino Headlands State Park (Appendix A – Map 1). This property is located immediately east of the town of Mendocino, and includes the lower 10 miles of the Big River corridor, as well as significant portions of the sub-watersheds that drain into that 10-mile section. The property also includes small portions of the Albion and Little River watersheds, although these are not potentially affected by this project.

This project incorporates a total of 12 sub-project sites scattered throughout the unit; these sites occur in Section 6, Township 16N, Range 16W; Section 1, Township 16N, Range 17W; Section 31, Township 17N, Range 16W; and in Sections 24, 25, 26, 28, 29, 30, 34, 35, and 36, Township 17N, Range 17W. Table 1 below provides site locations based on land grant coordinates for each sub-project. Specific locations of the various project components are denoted on site maps (Appendix B – Project Plan Sheets) and include primary topographic information (stream corridors, roads, landings, elevation contours), as well as denoting project areas of potential effect (APEs), staging areas, debris disposal sites, and travel corridors. Note that project areas of potential effect are located immediately along and adjacent (upslope or downslope) to existing roads that will be restored, reshaped, or otherwise recontoured, as well as upstream and downstream from the stream crossings where roads intersect the riparian corridors to be restored. The APEs have been established to exceed the geographical scope of actual project activities.

Throughout this document, a road numbering and mileage-measurement system is used to specify the locations of project activities, hereafter referred to as “sites”. For instance, along road M1, the “main haul road,” mileages shown represent distances from a measurement origin at the main haul road gate, located approximately 0.5 mile east of State Highway One at the easternmost part of the “entry area.” Site designations correspond to pertinent road numbers, and for the multiple sites along the main haul road, M1, also include the shortest distance from the main gate to each project site, as shown below in **Table 1**.

Table 1: Site Number Designations and Locations for Big River Watershed Restoration Project

Site Number Designations			
Road Number (or Area)	Mileage from Road Origin	Site Designation	Township, Range, Section, Quarter-Section
M1	0.64	M1-0.64	T17N, R17W, Sec. 29, SE¼
M1	0.70	M1-0.7	T17N, R17W, Sec. 29, SE ¼
M1	1.85	M1-1.85	T17N, R17W, Sec. 28, SE ¼
M1	2.06	M1-2.06	T17N, R17W, Sec. 28, SE ¼
M1	2.08-2.19	M1-2.08	T17N, R17W, Sec. 28, SE ¼, & Sec. 27, SW¼
M1	4.78	M1-4.78	T17N, R17W, Sec. 35, NE ¼
M1	5.63	M1-5.63	T17N, R17W, Sec. 35, SE ¼
M9	0.00-0.53	M9	T17N, R17W, Sec. 35, NE ¼
M14	0.00-2.08	M14	T17N, R16W, Sec. 31, SW ¼, NW ¼ ; T 17N, R 17W, Sec. 36, NE ¼ ; Sec. 25, SE, NE, NW ¼; Sec. 24, SW ¼
S22	0.44-0.88	S22	T16N, R16W, Sec. 6, SW, NW ¼
M1 - Quarry	0.75	Q	T17N, R17W, Sec. 29, SE ¼
Public Entry Area*	N/A	P1 and P2	T17N, R17W, Sec. 29, SW ¼; T17N, R17W, Sec. 30, SE ¼
M1	0.0-6.0	M1-0	T17N, R16W, Sec. 1, NW ¼; T17N, R17W, Sec. 25, 26, 27, 28, 29, 34, 35, 36

* Entry Area corresponds to existing Big River public parking and beach access areas immediately adjacent to and east of State Highway One, east to main haul road gate

Throughout the remainder of this document, Sites M1-0.64, M1-0.7, M1-1.85, and M1-2.06 have been treated as a single project, for descriptive purposes only, since preparatory and implementation at the four sites are similar. However, actual implementation of proposed remedial activities will probably not occur concurrently at the four sites. These four sites are characterized by the similarity of types of stream crossings and attendant problems, environmental conditions, proposed remedial measures, and have thus been treated here as one entity.

2.3 BACKGROUND AND NEED FOR THE PROJECT

This section describes the current conditions within the Big River unit, and more specifically at the proposed project sites, and explains why remedial actions are necessary and warranted.

The 7,332 acres that comprise the Big River unit of the Mendocino Headlands State Park share a collective history of approximately 150 years (1852-2002) of managed timber harvest and production. In 2002, the Mendocino Land Trust finalized the property acquisition from the Campbell-Hawthorne Timber Company and transferred the property to the California Department of Parks and Recreation (“DPR” or “State Parks”). The legal Agreement of Terms and Conditions for the property states: “the primary goals for the Property are to preserve and protect the intact estuary and wetland system and aquatic and other wildlife resources, and to support late seral forest characteristics and associated natural functions, and that use of the Property be consistent with the purposes of estuarine, wetlands, aquatic, fish and wildlife habitat preservation, restoration and management, estuarine, wetlands, aquatic, fish and wildlife-oriented education and research, and compatible public park and other public uses consistent with estuarine, wetlands, aquatic, fish and wildlife habitat preservation and restoration.”

The Big River unit lies within the tectonically active western portion of California’s North Coast Ranges; elevations range from sea level to about 1000 feet. The property includes portions of three watersheds (Big, Little, and Albion Rivers), although approximately 93% lies within the Big River drainage. Smaller tributaries that drain directly into the mainstem Big River have cut deep, narrow canyons in the steep terrain; geologically recent “drowning” of the historical river mouth, human activities (road building, timber operations), and sediment accumulations have been factors in the creation of a relatively broad floodplain along the 8-mile reach of the estuary. Streamside landslides from inner gorge landforms are a major sediment source, and drainage pathways that have been altered by road construction constitute a major source of surface instability. Road-related erosion represents one of the significant preventable sources of sediment in the project area. Inventories of roads and adjacent hillslope conditions by the California Geological Survey indicated that most of this sediment yield is derived from three primary sources: 1) failure of road and landing sidecast fill, 2) erosion at or associated with stream crossings, and 3) road surface and ditch erosion (California Geological Survey 2004; Circuit Rider Productions 2005).

This project will improve habitat conditions for fish, wildlife, and plant populations. Coho salmon, which are listed as federally endangered and as a State Species of Special Concern in this portion of the species range, and other salmonids will benefit from a reduction in sediment delivery to spawning and rearing habitat. This plan will improve habitat for Coho salmon and steelhead by restoring natural surface hydrology and eliminating stream flow impediments and runoff concentrations that cause gullies and slides and produce substantial sediment loads. Amphibians will benefit from an increase in suitable habitat, as well as a reduction in sediment delivery to potential habitat. In addition, DPR's goal of restoring natural vegetation patterns and improving conditions for natural slope processes will be aided by re-establishing natural drainage patterns, recontouring old roadways, and reducing the potential for landslides and roadway failures.

2.3.1 Sites M1-0.64, M1-0.7, M1-1.85, and M1-2.05: Existing Conditions & Need for Project

(For all references in this section, refer to sheets and figures in Appendix B - Road M1.0 High Priority Watercourse Restorations at Mileposts 0.6, 0.7, 1.85, and 2.05)

Four Class II watercourse crossings along Road M1.0 are composed of significant volumes of fill and are actively eroding; these have, by their construction and through the wear and failure of existing culverts, trapped substantial volumes of alluvial sediment (Table 2 below) on their upstream sides. The culverts conveying water through the crossing fill prisms are high above the natural stream channel and are too small to convey the 100-year flood and its associated load of sediment and debris. (Note: Table 2 shows the recommended culvert diameters, not the existing diameters.) The fill prisms and stored sediment create an ecological obstruction between the forested uplands above the crossings and the Big River estuary and floodplain approximately 200 feet downstream from each of the crossings. Specific baseline and design data for each crossing are provided in Table 2. Figure 1 (Plan Sheet 3) shows representative cross-sections that illustrate the ecological obstructions at each site.

Table 2. Pre-treatment quantitative data for Road M1.0 high priority watercourse crossings

Characteristic	Site Number			
	M1-0.64	M1-0.7	M1-1.85	M1-2.05
Miles from main haul road entry gate	0.64	0.7	1.85	2.05
Stream gradient, approx. historical (%)	27	16	23	21
Depth of fill beneath road surface (ft.)	17	19	12	13
Width of fill prism, perpendicular to road direction (ft.)	25	25	30	30
Length, average, of fill prism along road (ft.)	65	70	65	60
Volume, estimated, of fill prism in watercourse (yd ³)	1920	2580	1750	2000
Length of sediment wedge behind (upstream of) fill prism (ft.)	50	110	35	45
Width, maximum, of sediment wedge (ft.)	50	40	45	50
Volume, estimated, of sediment wedge (yd ³)	220	460	80	140
Volume, total, estimated, fill prism & sediment wedge (yd ³)	2140	3040	1830	2140
Volume, total, estimated, including 20% contingency	2570	3650	2200	2570
Area of watershed upstream of crossing (ac.)	20.9	48.1	63.3	64.2
100-year flood flow (cfs, rational method)	60	140	180	180
Diameter of appropriately sized pipe (at 2/3 full) (in.)	60	84	96	96
Length of bridge, as designed (ft.)	75	80	70	65
Width of stream channel beneath bridge (ft.)	15	20	25	25
Slope (horizontal:vertical) of channel sides beneath bridge	1.8:1	1.6:1	1.9:1	1.6:1

2.3.2 Site M1-2.08: High-Priority Fillslope Removal: Existing Conditions & Need for Project

(For all references in this section, refer to sheets and figures in Appendix B - Road M1-2.08-2.19, High Priority Fillslope Removal)

At approximate milepost 2.1, along the main access road M1.0 (Sheet 2), about 2,400 cubic yards of fill is perched adjacent to the road and immediately above Big River. Portions of this fillslope have failed in the past resulting in direct sediment delivery to the river and unsafe vehicle passage along the road. Cracks in the roadway surface re-

open each year during the late spring and summer, an indication of ongoing fill settlement and likely eventual failure. Additionally, uncontrolled runoff from the adjacent old skid trail continues to adversely impact Road M1.0 and was a likely contributor to the 2003 fillslope failure. DPR proposes to remove this section of fillslope to reduce the potential for mass wasting that would adversely impact the road and deliver sediment directly into Big River.

2.3.3 Site M1-4.78 High Priority Watercourse Crossing Remediation: Existing Conditions & Need for Project

(For all references in this section, refer to sheets and figures in Appendix B - Road M1-4.78, High Priority Watercourse Crossing Remediation)

The Class II watercourse crossing at this site (Sheet 2) includes a 100-foot long fill prism and a 36-inch corrugated metal culvert. The culvert is significantly undersized, sediment has accumulated on the floodplain immediately upstream from the culvert, mounds of fill disrupt the topography of the floodplain, and the channel makes an abrupt 90-degree turn at the culvert inlet. In January 2004, a fillslope failure along Road M9.0 delivered a significant amount of sediment to this watercourse approximately 1,300 feet upstream from the culvert. The resultant discharge of water and sediment buried the culvert inlet and water then flowed onto the road. Once the culvert was buried, inboard ditches draining M9.0 and M1.0 backed up, causing more uncontrolled water flow across the road. DPR proposes to replace this culvert with a railroad car bridge and remove much of the stored sediment in order to restore a more naturally functioning watercourse at this location.

2.3.4 Site M1-5.63 High Priority Culvert Removal: Existing Conditions & Need for Project

(For all references in this section, refer to sheets and figures in Appendix B - Road M1-5.63, High Priority Culvert Removal)

Along the main access road M1.0, at mileage 5.63 (Sheet 2), a culvert is concentrating runoff, accelerating erosion of the streambank, and causing direct sediment delivery to Big River. This section of road lies within 40 feet of Big River and is perched above an outside meander bend. The culvert drains water from a dormant deep-seated landslide, and its outlet is approximately 12 feet from the low water line of Big River. Continued reliance on this culvert will increase the sediment delivery from this Class III stream crossing into Big River, and increase the chances of a future culvert or fillslope failure at this crossing.

The California Department of Parks and Recreation proposes to remove the culvert, regrade the road surface to achieve a low-angle approach to the stream crossing, and create an armored stream crossing road surface at the stream crossing. The grade of the steepened fillslope will be decreased, and the width of the road narrowed to accommodate the reduced pitch of the slope.

2.3.5 Site M9: High Priority Road Drainage Improvement and Revegetation: Existing Conditions & Need for Project

(For all references in this section, refer to sheets and figures in Appendix B - Road M9-0.0-0.53, High Priority Road Drainage Improvement and Revegetation)

Road M9 (M9) diverges from Road M1 at mileage 4.78. It is a rocky road that provides access into a small sub-watershed informally known as No-Name Gulch (Sheet 2). M9 is approximately two miles long and switchbacks up a steep north-facing slope, then winds around a broad spur ridge and eventually joins Road HC1 that traverses Hi-Chute Ridge. In turn, HC1 connects to County Road 720 approximately 2 miles north of the intersection with M9. Thus, M9 is a link in a 14-mile loop through the heart of the Big River unit and to county roads that lead either to the town of Mendocino and Big River Beach, the Mendocino Woodlands State Park, or State Highway 20 and the cities of Fort Bragg and Willits. A loop road for vehicular traffic at this location appears desirable in order to achieve long-term restoration goals for the Big River unit. More specifically, if M9 and HC1 were stabilized, improved, and maintained as a vehicle access route (linked with M1 west) through the Big River unit, approximately 3 miles of the M1 road east of its junction with M9 and adjacent to Big River could be eliminated as part of the mainstem restoration effort. In addition, M9 provides access to Roads M9.1 and 9.3 that lead into other subwatersheds that have been identified as high priority restoration areas. Because M9 appears to provide significant potential for watershed restoration within the Big River unit, DPR considers maintenance of this road to be a high priority.

Along the first 1,500 feet from the intersection with M1, Road M9 traverses the base of a steep (~55 percent) slope and lies within approximately 150 feet of the Class II watercourse that drains No-Name Gulch. The natural slope above the road is steep and has been highly modified by skid trail construction, the next upslope section of M9, timber harvest, shallow debris sliding, and dormant landsliding. Consequently, this slope is considered disturbed and has a relatively high potential for future failure due to its instability. The slope below the road is mapped as a debris slide slope (Smelser et al. 2004). This lower stretch of M9 was constructed by cutting into the disturbed slope using typical cut- and side-cast fill design that created oversteepened fill slopes upslope from the watercourse. In addition, the road was constructed as generally insloped with an inside ditch and outboard edge berm. Oversteepened sidecast fillslopes typically have a much higher potential for failure than do engineered fill slopes constructed with compacted fill. Construction of oversteepened sidecast fillslopes on natural slopes with a high potential for instability further increases the potential for fillslope failures that remove portions of the road. When such conditions are located close to watercourses, a fillslope failure commonly delivers sediment directly into the watercourse.

In the winter of 2003-04, a portion of the fillslope along M9 failed at mileage 0.2, reducing the roadway width and delivering sediment into the stream. Because of that failure, this roadway segment is now classified as a high priority remediation site. Maintaining this lower segment (1,500 feet) of M9 appears worthwhile at this time because of the need for access into the watershed and because the M9-HC1 loop road may significantly increase the opportunities for watershed restoration efforts along Big River and its estuary. While maintaining this lower segment appears worthwhile, the level of maintenance required needs to incorporate the following considerations: 1) this road is poorly constructed in a poor location (i.e., likely to be costly to maintain as an all-weather, all-vehicle access road), and 2) more extensive data compilation, analysis, and prioritizations may later support a decision that the M9-HC1 loop road is undesirable for ecological, maintenance, or financial reasons.

In consideration of these conditions, only a minimum maintenance effort appears warranted at this time. The level of such an effort can be determined by examining the contributing factors that led to the 2003-04 fillslope failure. Engineering geologic analysis by the California Geological Survey of the failure revealed the following: 1) stormwater runoff from the upper segment of M9 appears to have discharged via a ditch relief culvert onto the disturbed slope immediately above the roadway failure; 2) the slope area immediately above the failure is significantly disturbed by skid trails, disrupted drainage paths, and shallow debris slides; 3) shallow rills in the roadway leading to the failed section indicate uncontrolled roadway runoff; 4) vegetation within the inside ditch and local cutslope sloughing appear to have reduced the capacity of the inside ditch, thereby promoting uncontrolled drainage down the road; 5) relatively lush vegetation along the inside ditch at the failure location indicates that this area may be saturated year-round, including the pooling of water; 6) at its narrowest point the failure has reduced the roadway width to 12 feet; 7) soil pipes in the headscarp indicate that significant volumes of near-surface groundwater helped saturate the fillslope at this location; and 8) the area of failed ground (headscarp and zone of depletion) is unvegetated and vulnerable to gully erosion and sloughing.

In summary, the analysis of contributing factors strongly indicates that several aspects of the existing roadway drainage system failed, resulting in the accumulation of a significant amount of water along the road at this location. The accumulation, in turn, led directly to saturation and eventual failure of the weak and poorly constructed fillslope, along with some underlying native material, at this location. The failed roadway drainage system continues to cause rill erosion within the landslide scar area. In conclusion, the minimal level of maintenance appears to require the following: 1) repair and enhancement of the roadway drainage system; and 2) erosion control and revegetation of the landslide scar area. It should be noted that outsloping and construction of rolling dips along this segment of road is considered beyond a minimal level of maintenance because such work requires heavy equipment and currently no specific plans for motorized vehicle use on M9 have been adopted. When and if such plans are developed, heavy equipment can be employed in outsloping the road surface and improving drainage at that time.

2.3.6 Site M14: High-Priority Watercourse Crossings and Road-to-Trail Conversion: Existing Conditions & Need for Project

(For all references in this section, refer to sheets and figures in Appendix B - Road M14-0.00-2.08 High Priority Watercourse Restorations & Road to Trail Conversion)

Old logging Road M14, the primary travel corridor linking Road M1 to the Mendocino Woodlands State Park area, traverses the Big River terrace surface lying approximately 20 feet above the low-flow stream level. This old road is largely overgrown but is currently used by hikers, bicyclists, and equestrians, as well as trespassing motorcyclists. Access by other motorized vehicles is not possible because of fillslope failures that have significantly reduced the width of the road along many reaches. M14 begins at a shared intersection with roads M1, M11, and M13 at approximate river mile 8.5. (Sheets 2 and 3). From the shared intersection, M14 extends several miles upstream and passes through the Mendocino Woodlands State Park (the Woodlands). Consequently, M14 is a critical recreational link in a 25-mile loop that traverses from the

town of Mendocino, through the heart of the Big River unit, and connects to the Mendocino Woodlands. The segment of M14 between the shared intersection and the Woodlands is approximately 2.5 miles long. From the intersection to the Big River unit property boundary is 2 miles. Along that 2-mile stretch, M14 generally lies within 200 feet of the river. Locally, however, that distance can be as great as 600 feet and in other cases the road is perched immediately above the river. Most of M14 was built along the base of the hillside using typical cut-and-fill construction techniques. However, some segments are "all-fill" prisms constructed on the terrace surface and others are cut through the terrace. In general, through-cut areas are less than 5 feet deep, fillslopes extend between 3 feet and 12 feet above the terrace surface, and near-vertical cutslopes over 20 feet high are common. In addition to the cut- and fillslopes, this 2-mile section of M14 includes 18 culverted Class II and Class III watercourse crossings. Because the road lies within the riparian corridor of Big River and was constructed on a terrace surface that is inundated by flood flows on a 5- to 8-year recurrence interval, portions of M14 are frequently inundated, thereby limiting access and saturating the fill prism. Such flooding and saturation appear to have caused several segments of the fill prisms and native slopes to fail and erode, effectively undermining the road. Preliminary measurements indicate that the 18 watercourse crossings represent approximately 3,200 cubic yards of anthropogenically deposited sediment in these watercourses. In addition to the sediment deposits, the fill prisms and culverts form ecological obstructions between the forested uplands upstream from the crossings and Big River, located immediately downstream. In addition, twelve of the culverts are calculated to be too small to convey the 100-yr. flood and its associated load of sediment and debris.

The primary project benefit will be the removal of ecological obstructions on the Big River floodplain. Secondary benefits include the removal of approximately 3,200 cubic yards of fill that exist in the channels, and the removal of approximately 1,400 cubic yards of fill perched immediately above Big River. In addition, the removal of the 18 culverts eliminates the need for maintenance and the potential for plugging and catastrophic failure. A final benefit is the conversion of an old logging road into a trail that links together 25 miles of road in and around the Big River unit providing access for recreation, emergency response, and the completion of restoration efforts.

2.3.7 Site S22: High Priority Road Removal: Existing Conditions and Need for Project

(For all references in this section, refer to sheets and figures in Appendix B - Road S22-0.44-0.88, High Priority Road Removal, 8 sheets)

Road S22.0 between mile markers 0.44 and 0.88 (Sheet 2) traverses a steep slope within a debris slide amphitheater. This segment of road parallels a Class III watercourse that lies about 100 feet downslope, and the end of the road is approximately 300 feet from Big River. The road is very steep in places, continuously rilled throughout its length, and the existing waterbars have failed. In addition, several portions of the fillslope and cutslope along this road have failed delivering sediment downslope. This segment of road is considered a high priority restoration site because of its location within a steep debris slide amphitheater and its close proximity to watercourses, the continuity of the rills and the resultant hydrologic connection between subwatersheds, and because of illegal use and erosion by motorcycles.

2.3.8 Site P1 and P2: Parking Lot, Entry Area, and Restroom: Existing Conditions and Need for Project

(For all references in this section, refer to sheets and figures in Appendix B - Parking Area)

The existing entry access to the Big River unit is from State Hwy. 1, eastside, immediately north of the Big River bridge. The access road (the former Hwy. 1 route) ramps downslope and east from Hwy. 1, making a sharp right turn to the south and descending to river-estuary floodplain level, where ill-defined parking areas are located. The parking area nearest to the bridge and bridge approach embankment provides the most proximate parking for foot access to the outer (western) portion of Big River beach; approximately 0.2 acres of this lot is situated on a California Dept. of Transportation easement. A smaller area immediately southwest of the signpost, along the remaining pavement surface of the former Hwy. 1 estuary crossing, provides several parking spaces of closest access to the estuary beach. The Big River access or entry road (also known as the "main haul road") itself, turns eastward (left) and more or less parallels the Big River estuary channel, at a distance of 50-100 meters from the estuary channel. To the north is a wetland area several acres in size (the former sawmill pond); the roadbed is elevated approximately 1-2 meters above the winter water level in the wetland, and 2-3 meters, maximum, above the mean tidal level of the Big River estuary. The road continues on approximately one-third mile eastward to the Big River main haul road gate.

This entry road is generally riddled with potholes and is unevenly paved; vehicles avoid potholes by driving across the sandy, silty, gravelly expanse of floodplain along the south side the road. This large open area to the south of the access road, approximately 2 acres, is also marked by numerous large depressions that pool water during the rainy season. In 2003, State Parks placed a number of large boulders immediately along the north side of the road, to reduce the incidence of off-road vandalism and damage to the wetland; this measure has virtually eliminated vehicular access to this area. Beyond the largest contiguous open "parking" area south of the haul road is an undesignated boat launch ramp; further on, beyond a small area of brush and weeds, is another small parking area, the most proximate to the main haul gate and the Big River unit. This area has also been vandalized by vehicular traffic, with significant damage to soil surfaces outside consensus parking areas.

The entire entry area of the Big River unit covers approximately 9 acres, of which about 5 acres constitute existing road surface or parking for motor vehicles. At many points, vehicular access to the beach, estuary, wetlands, or native vegetation is unrestricted, and vehicle trespass on the beach or into wetlands is a frequent occurrence. The lack of defined and delimited parking areas and road surfaces exacerbates the potential for off-road damage to the beach and the wetland. Stunt driving maneuvers (e.g., spinning "donuts," mud-slogging, etc.) are a common occurrence in this area. Continual impacts on the road and the expansive areas open to vehicular access result in the generation of considerable amounts of sediment that, during storm events, flows into both the wetland and the estuary. Off-road and unsafe vehicle operation in the area also endanger park users, wildlife, and wildlife habitat.

Park visitors to the Big River entry area currently have one portable toilet available; this is located at the base of the Highway 1 embankment in the westernmost parking area that provides the closest parking to the beach. This toilet is positioned within 100 feet of rare plant habitat, and is not conveniently located for use by visitors using the main haul road, boat launch area, or points east. Toilet paper and other litter mar the brush and wooded areas along the northern edge of the floodplain within and adjacent to the wetland north of the main haul road. The mapped 100-year floodplain (California Geological Survey 2005) includes most of the Big River parking areas and adjacent wetlands.

2.3.9 Site Q: Big River Rock Quarry: Existing Conditions and Need for Project

The Big River Rock Quarry is located on Road M1, approximately 0.75 mile east of the main haul road gate. The quarry was last operated as a commercial source of road-base and rock in 2002. Upon acquisition of the Big River property from the Campbell-Hawthorne Timber Company in 2002, the lease for quarry operation was terminated and operations ceased.

Although the quarry was operating under the Surface Mining and Reclamation Act of 1975 (SMARA), and regulated by the California Department of Conservation and the County of Mendocino, the full terms of the operator's reclamation plan were not completed prior to operator withdrawal from the terms of the plan. As a result of the numerous ecological, economic, public safety, and aesthetic liabilities the quarry poses, DPR will assume responsibility for reclaiming and restoring the quarry site in order to resolve the current slate of unresolved management issues.

Despite the introduction of non-native fill by the operator during the aborted quarry reclamation, a significant proportion of the volume of the original quarry pit remains open, with a "finished" grade well below that of the original topography of the site, and also well below the elevation of the adjacent M1 roadway. The slopes into the pit have not yet completely stabilized, with soil sloughing, rilling, and gulying in evidence, especially on the newer fill slopes, and fill-slopes, talus, and exposed rock faces above the pit are either barren or populated largely by non-native invasive plant species, such as jubatagrass, Scotch broom, annual grasses, and thistles. The bottom of the pit accumulates surface runoff during the wet season, and the resulting pond supports breeding of mosquitoes, Dytiscidae beetles, and tree frogs. The high quarry walls pose a considerable safety hazard to park visitors and wildlife, and the entire site is ecologically and aesthetically incongruous with the surrounding forest and Big River riparian corridor. Local residents and park visitors have frequently noted this incongruity to State Parks staff.

2.3.10 Site M1-0, Main Haul Road: Existing Conditions and Need for Project

Road M1, the main haul road at the Big River unit, is the main access corridor to all points on the north side of Big River within the unit. The road served for several decades as the primary vehicular and equipment access for timber operations in the lower Big River watershed. Most "logging" roads at Big River were constructed by "cut-and-fill" methods, where the upslope is excavated to create a bench and widened on the

downslope side by the spoils generated from the upslope fill. This creates a roadbed that is partially constructed on native, putatively more stable substrate, and partially on deposited fill. Current roadbed surface width, including adjacent widened “flats” and outside berms, varies from about 20 feet to well over 50 feet in some areas.

In addition to the “cut-and-fill” construction method, most of the roads at Big River have been graded level or slightly against the existing slope, creating the need for “inboard” ditches to channel upslope and road-surface runoff along the roads on their upslope sides. These inboard ditches then must be “relieved” with culverts situated at intervals along roads. These culverts facilitate the movement of water and sediment downslope when they are positioned appropriately and maintained to minimize clogging. However, when culverts fail because of improper placement or debris-clogging, runoff accumulated in the inboard ditches will often travel across a road surface, causing erosion and at times, outright road surface or fill-slope failures. In addition, many such culverts erode soil at their outfalls, creating “shotgun” culverts and gullies that further exacerbate streambed or slope erosion. The resulting gullies can move large amounts of sediment and debris rapidly downslope to streams and to Big River.

In some areas along M1 and other Big River roads, fill slopes and drainage problems have been further compounded through the deposition of soil and debris along the outside (downhill) side of the roads, creating outside berms. These berms, where a road surface is outsloped, trap runoff and can create further instability in fill-slopes along roads. Where roads are insloped (the general condition), these berms provide a source of sediment to the road surface and inboard ditches.

The sum effects of these road-construction methods include fill-slope failures, road surface erosion, failed culverts, sediment-filled inboard ditches, downslope erosion, and sedimentation of streams and Big River. These construction methods also require a substantial level of road and drainage systems maintenance in order to avoid slope and roadbed failures and to keep this main access corridor open. Since the 2002 transfer of the Big River property to State Parks, numerous fill-slope and road surface failures have provided clear evidence of the need for either a dramatic increase in funding and staffing for road maintenance, or reconstruction of road surfaces and drainage systems that will facilitate improved drainage along roads while reducing structural liabilities and erosion potential, as well as greatly reducing long-term maintenance needs.

2.4 PROJECT OBJECTIVES

Specific project objectives are listed below for each sub-project area. Collectively, these objectives will achieve the following project goals:

- Removal of the large volumes of stored sediment in the stream basins;
- Restoration of the impacted segments of these watercourses to their natural topography, gradient, structure, and vegetational composition;
- Re-connection of the forested uplands to downstream reaches, the Big River estuary, and the river’s floodplain;
- Improvement of habitat for anadromous fish, amphibian, plant, and invertebrates;

- Construction of environmentally sound and safe stream crossings to allow continued recreational use of the main haul road, as well as access for official or emergency purposes;
- Repair of vulnerable stream crossings, fillslopes, and other potential areas of high maintenance, in order to keep park roads open to visitors; and
- Re-use of reclaimed site-native soil, rock, and vegetation as is possible in each of sub-project areas.

2.4.1 Sites M1-0.64, M1-0.7, M1-1.85, and M1-2.05: Objectives

Project objectives for these four sites along Road M1 include the following:

- removal of sediment wedges, and in-grown vegetation on these wedges, behind stream-crossing road prism fill at each site;
- removal of all introduced fill used to create stream crossing road prisms, including in-grown vegetation;
- removal of non-native invasive plant species within project areas;
- removal of all culverts or other introduced material (support columns, braces, etc.)
- re-establishment of stream basins to historical stream gradients;
- re-establishment of historical slope pitches along stream channels;
- introduction, as needed, of rocks and woody debris to augment stabilization of stream channels and to create stream architecture favorable to fish and other native animals;
- construction of bridges to span stream corridors;
- re-establishment of native vegetation, including tree cover, along stream corridors;

2.4.2 Site M1-2.08: Objectives

Project objectives for this site include the following:

- removal of the oversteepened fill along the road;
- reduction of road surface width;
- obliteration of the existing inside ditch;
- outsloping of the road surface within the site;
- control of intermittent runoff that flows from the overgrown skid trail;
- installation of erosion control materials;
- passive native plant revegetation.

2.4.3 Site M1-4.78: Objectives

Project objectives for this site include the following:

- removal of stored sediment and fill mounds immediately upstream from the culvert;
- restoration of the natural floodplain and channel gradient;
- replacement of the existing fill prism with an all rock fill prism;
- reduction of roadway width;
- removal of the existing 36-inch culvert and replacement with a railroad car bridge;
- installation of erosion control materials;
- riparian habitat restoration.

2.4.4 Site M1-5.64: Objectives

Project objectives for this site include the following:

- removal of the existing culvert and associated fill;
- construction of a rocked rolling dip to reduce the erosion rate and to partially reconstruct the stream channel;
- removal of oversteepened fill along the adjoining segment of Road M1;
- reduction in roadway width.

2.4.5 Site M9: Objectives

Project objectives for this site include the following:

- clearance of the inside ditch;
- construction of waterbars at 100-foot intervals along the lower 0.5-miles of M9;
- installation of check dams along rills within the scar area;
- creation of terraces;
- revegetation of the scar area.

2.4.6 Site M14: Objectives

Project objectives for this site include the following:

- excavation and removal of the fill prisms and culverts at 18 locations;
- restoration of the Class II and Class III tributary channels that have been buried;
- obliteration and recontouring of approximately 1,000 feet of spur road;
- removal of approximately 900 linear feet (~1,500 cubic yards) of oversteepened fill slopes immediately adjacent to Big River;
- placement and compaction of excess fill into road corridors targeted for elimination;
- conversion of road to trail;
- revegetation of newly contoured slopes and stream crossing approaches.

2.4.7 Site S-22: Objectives

Project objectives for this site include the following:

- elimination of inter-basin transfers of runoff caused by rills and gullies in the road;
- restoration of primary topographic features that affect broad runoff patterns;
- reduction in the erosion and mass wasting of the roadway, fillslopes, and cutslopes;
- elimination of illegal through access to Big River and adjoining roads by off-road vehicles.

2.4.8 Site P1 and P2: Objectives

Project objectives for this site include the following:

- Provision of delineated parking areas, through placement of large boulders, for at least 100 vehicles;
- Provision of parking spaces for approximately 20 vehicle-trailer combinations;
- Gravel road-base surfacing of existing road and designated parking areas;
- Restriction of motor vehicle access to areas outside designated parking areas for motor vehicles, through placement of large boulders;

- Designation of a single boat-launch area and ramp, including posting of pertinent laws and regulations;
- Construction of a permanent vault-type toilet building toward the eastern end of the Big River entry area, approximately 200 feet west of the main haul road gate, outside the 100-year floodplain (as assessed by CGS 2005; see Appendix A – Map 1 for location);
- Posting of regulatory, informational, and interpretive signs in the entry area.

2.4.9 Site Q: Objectives

Project objectives for the quarry site include the following:

- Utilization as a deposit site for fill material removed from the other Big River unit project sites;
- Removal of the outside berm along Road M1 immediately adjacent to the quarry site;
- Outsloping of Road M1 adjacent to the quarry site, as needed to accommodate potential sheet drainage across the road;
- Removal of unstable rock and gravel and stabilization of quarry slopes immediately adjacent to Road M1;
- Distribution and compaction of introduced fill material in quarry pit to reduce the depth of the pit, and as much as possible, to re-establish a soil contour against the near-vertical north quarry wall;
- Provision for slope and soil stabilization, erosion-control measures, and appropriate drainage and conveyance on all fill introduced into the quarry;
- Re-vegetation of all exposed fill in the quarry once final desired grading has been achieved.

2.4.10 Site M1-0: Objectives

Project objectives for Road M1 from mileage 0.0 through mileage 6.0 include the following:

Wherever feasible, based upon existing local topography, surface conditions, and drainage regimes,

- Removal of outside (downslope-side) berms along the road;
- Deposition of removed berm and other fill material against upslope road edges to create low-angle, outsloped road surfaces that will disperse surface runoff across roads;
- Elimination of inboard ditches (through deposition of fill and re-contouring of the road surface) and attendant ditch-relief culverts that service corresponding sections of inboard ditches;
- Removal of ditch-relief and small-stream culverts and replacement with lowered road surface relief (rolling dips) or armored fords;
- Narrowing of the roadbed surface to restore, in part, historical slope pitches and contours;
- Treatment with appropriate erosion control materials and methods;
- Site monitoring and maintenance of erosion controls and invasive plant species;
- Revegetation, as necessary, with native plants.

2.5 PROJECT DESCRIPTION

This section provides a site-by-site summary of the proposed activities. Detailed project designs are provided in the Appendices. In general, these measures are intended to rehabilitate stream corridors, reduce erosive potential of roadbed-stream crossings, partially restore the historical topographical contours to existing roadbeds, convert existing roads to trails, restore native vegetation to rehabilitated stream corridors and fill-slope failures, partially restore the historical topography to the Big River Rock Quarry pit, improve parking and define vehicular access in the entry area, and provide a rest-room facility for the Big River unit of Mendocino Headlands State Park. Site-specific project activity details for project sites M1-0.64, M1-0.7, M1-1.85, M1-2.06, M1-2.08, M1-4.78, M1-5.63, M9, M14, and S22 have been based upon technical assessments, rehabilitative measures, and construction designs provided by the California Department of Conservation, California Geological Survey (CGS). The CGS information has been augmented by the California Department of Parks and Recreation in order to provide details for Site Q and Site P, as well as to articulate and address site-specific design features, such as bridge construction specifications, and environmental concerns, such as reduction of impacts to a less-than-significant level or elimination of impacts on sensitive wildlife and plant habitats and existing visitor use patterns. DPR has also added information on required or recommended remediation practices, restoration techniques, and monitoring and maintenance protocols.

2.5.1 Sites M1-0.64, M1-0.7, M1-1.85, and M1-2.05: Project Description

The California Department of Parks and Recreation (DPR) proposes to remove these crossings to 1) remove the large volumes of stored sediment in the streams, 2) restore the impacted segments of these watercourses, and 3) reconnect the forested uplands to the Big River estuary and floodplain. General tasks associated with re-constructing stream crossings include: 1) excavation and removal of the fill prisms, culverts, and stored alluvial sediment at the 4 crossing locations; 2) restoration of those sections of the Class II tributary channels that were buried by the existing roadbed fill prisms and the resulting alluvial sediments; and 3) construction of bridges above the restored channels to allow sunlight onto the riparian corridors, and to maintain access for pedestrians, equestrians, and bicyclists, as well as controlled access by State Parks and other public safety vehicles. The primary project benefit will be the reconnection of both terrestrial and aquatic habitats between four forested subwatersheds and the Big River floodplain and estuary. Secondary benefits include the removal of approximately 11,000 cubic yards of fill and sediment that are an existing, chronic source of sediment discharge. In addition, removal of culverts will eliminate the need for ongoing maintenance and the potential for plugging and catastrophic failure. Construction of bridges will provide for continued recreational access along M1, as well as for emergency and official vehicular use.

During project implementation (site excavations, construction of support structures, and placement of bridges), Road M1 will be closed to all park visitors and will be inaccessible to emergency vehicles. Signs and public notices to these effects will be posted in advance of all project implementation phases. Park access along other roads or trails would not be restricted, although the project areas will be closed to the public during most restoration and construction activities.

Sites M1-0.64, M1-0.7, M1-1.85, and M1-2.05 Bridge Construction and Design: The proposed project includes the construction of small bridges to accommodate pedestrians, bicycles, horses, and vehicles on official business (e.g., maintenance and public safety). Bridges represent the most effective method through which to achieve optimal stream corridor restoration, and these 4 bridges will accommodate full streambed restoration by completely spanning reconstructed stream corridors and streambanks at the 4 crossings. Please refer to Table 1 in Section 2.3.1 above for bridge lengths and stream crossing information.

Bridges will be about 16 feet in width, constructed from reinforced railroad flatcar decks positioned at either end on concrete abutments, and retrofitted with railings of appropriate height above bridge decks. Each abutment will lie below surface grade in order to allow the bridge deck to be placed at road surface grade for a smooth transition. Abutments will exceed bridge width on either side by about 2 feet, and will be approximately 8 feet wide and 4 feet deep. Abutments will be placed in order to retain a minimum of a 2-foot wide, compacted soil sill between abutments and adjacent streambank slopes; thus, the entire construction of bridges will occur outside the respective streambank profiles. For this reason, all bridge decks will be reinforced to accommodate weights in excess of the legal minimum limits. Bridge reinforcement, retrofitting, and construction will be conducted under the supervision of a State of California-licensed structural engineer. As needed, bridge decking will be surfaced to provide optimal traction for pedestrians, horses, and vehicles. Railings will be installed along both sides of the bridge along its full length.

2.5.2 Site M1-2.08: Project Description

DPR proposes to correct the conditions at this site that have led to continuing failures of the road fill prism, resulting in bulk slipping of the roadbed and its closure to vehicles, with the potential to deliver bulk sediment and debris directly into Big River immediately (~50m) downslope. Primary project activities will include the removal of oversteepened fill along the road, and a resulting narrowing of the roadbed along this section. The inside ditch here will be eliminated, and M1 will be outsloped along this section to provide for sheet drainage across the road. In order to control drainage into this area, improvements on the skid trail immediately above the road at this site will include the construction of cross-drains or berms to reduce the volume of water moving across this section of the road. Excess fill material not used on-site will be removed to the quarry site. Exposed slopes will be treated as specified in Appendix C, Standard Specifications & Best Management Practices for Disturbed Lands Remediation. The site will be assessed and monitored for revegetation needs during and following remediation. Revegetation, if necessary, will consist of native species planted on exposed slopes and the old skid trail.

2.5.3 Site M1-4.78: Project Description

A major fillslope failure along Road M9 about 300 meters upslope from this stream crossing is partly responsible for the volume of alluvium that has been deposited behind the undersized 36-inch culvert at this site (see section 2.5.5 for remedial measures along M9). DPR proposes to remove the culvert and the stored sediment and fill mounds immediately upstream, in order to restore the natural floodplain and channel gradient. The existing road fill prism will be replaced with a 100% rock fill prism, and the

road width at this crossing will be reduced. To accommodate stream flow and retain stream gradient and structure, a railroad car bridge will be placed here. This site will be monitored and assessed during and after the bridge placement and road work for revegetation needs; introduced plantings will be from locally native sources.

2.5.4 Site M1-5.63: Project Description

Along this approximately 350-foot section of Road M1, DPR proposes to alter the road gradient in order to reduce sediment that is currently delivered directly into Big River, which lies about 40 feet from the roadbed. To accomplish these objectives, DPR will remove the oversteepened fill along this road segment and replace the culvert with the rocked, rolling dip that will serve to channel the small tributary drainage effectively without eroding the stream channel or the Big River bank below. The existing culvert, which is concentrating runoff and accelerating streambank erosion, will be removed and replaced by a rocked, rolling dip about 80 feet in length. The M1 road gradient approaches to this rolling dip will be altered (lowered relative to the current road level), reduced in width, and outsloped to facilitate sheet drainage across the roadbed.

2.5.5 Site M9: Project Description

DPR proposes to improve the existing drainage system along the lower M9 road segment and to revegetate the scar area of the recent fillslope failure. Using only manual labor, the project tasks include clearing the inside ditch and constructing waterbars at 100-foot intervals (unless otherwise specified), under the direction of the Project Inspector (PI), to ensure that no pooling of water occurs along the road within this area and that no water discharges onto the scar area from the road. Also using hand labor within the scar area of the recent fillslope failure, small check dams will be constructed of rock within the established erosional rills. Existing surface benches will be enhanced as drainage control areas as well as for concentrated plantings, and the entire scar area will be terraced and planted under the direction of DPR natural resources staff. The existing ditch relief culvert along M9 above this site will be plugged to prevent roadway runoff onto the slope above the failed road section.

2.5.6 Site M14: Project Description

The California Department of Parks and Recreation (DPR) proposes to remove the 18 culverted watercourse crossings along M14, convert the road to a trail, and recontour the lower-most segments of three spur roads and an adjacent section of Road M11. An important aspect of this road to trail conversion will be the construction of ramps (inclined at 10 percent) into and out of the exhumed watercourses. Collectively, the removal of the watercourse crossings and the construction of the ramps will generate approximately 10,000 cubic yards of fill. In an effort to minimize the amount of fill to be trucked off-site, numerous segments of the Road M14, along with 3 adjoining spur roads and Road M11, have been designated as fill storage sites where fill can be placed and compacted up to a maximum thickness of 18 inches. Two additional spur roads have been identified where fill can also be placed, to be determined by the PI as material is generated. Preliminary estimates indicate that the M14 road segments and adjacent spur roads may collectively accommodate approximately 9,000 cubic yards of fill. These storage sites are described in the task list and are also shown on the plan sheets. Excess fill generated along the M14 corridor that cannot be accommodated on

other portions of M14, the adjacent spur roads, and M11 will be removed to the Big River quarry site.

At each stream crossing, the existing road prism fill and culverts will be removed. As noted, the M14 roadbed will be recontoured to accommodate the descent into these stream corridors, and the converted road will be armored with rock fords at these crossings. Temporary footbridges to accommodate pedestrians and equestrians will be installed over the stream crossings where trail use may have the potential to cause surface erosion leading directly to the channel. Rock ford and foot bridge construction will follow the California Department of Parks and Recreation Trails Handbook specifications.

2.5.7 Site S-22: Project Description

In order to reduce the sediment originating from the steep section of Road S22.0 between mile markers 0.44 and 0.88, DPR proposes to remove this segment of road primarily by partial recontouring. Native soil from oversteepened fill along the road will be used to partially re-fill the original road cut, resulting in a partial restoration of historical topography. In addition to the partial recontouring, drainage improvements will be constructed along the upper portion of the road, from mileage 0.0 to 0.44, to better control runoff conveyed along the inside ditch. These activities are designed to eliminate intra-basin transfer of precipitation and sediment caused by rills and gullies in the road, to restore the area's topography in order to facilitate more evenly distributed drainage across the landscape, and to reduce erosion and degradation of the existing fillslopes and cutslopes along the road.

2.5.8a Site P1: Parking and Entry Area: Project Description

The primary activity in the parking and entry area at the Big River unit will be the delineation of parking and driving surfaces. Large boulders, similar to those already in place along the north side of the entry road, west of the main haul road (M1) gate, will be positioned to delimit acceptable driving and parking surfaces; boulder spacing is estimated at 5 feet. The large existing parking area along the south side of the entry road will be defined, along its southern edge, with the placement of boulders to keep vehicles from accessing the estuary beach. In similar fashion, the small parking lot nearest Hwy. 1 will be delimited to keep vehicles off the estuary beach (at the old Hwy. 1 estuary crossing) and out of soft sand and the wetland area immediately east of Hwy. 1 at the entrance road. The total linear distance of the rows of boulders is estimated as 1100 feet; at an estimated ½ ton each, with 5-foot spacing, about 110 tons of boulders will be used. All parking areas will be surfaced with road base gravel to repair existing potholes and swales.

The entry road will be re-paved to repair the existing asphalt surface. The repaving will extend from the base of hill (near the first parking area) to the location of the new restroom building (see Section 2.5.8b), including pavement of 2 parking spaces compliant with the Americans with Disabilities Act (ADA) and the access walkway and ramp from the ADA-compliant parking area to the restroom building.

The approved small boat launch area at the eastern end of the largest parking area will be signed appropriately for acceptable types of watercraft. Other appropriate signs will be placed at the Big River entrance and elsewhere to inform visitors about State Parks regulations and park policies.

2.5.8b Site P2: Restroom Building Installation: Project Description

State Parks will install a two-unit, all-access restroom building at this site, approximately 200 feet west of the main haul road gate, along the north side of the entry road just below a moderately pitched, stable fill slope, and adjacent to the eastern end of the largest parking area. The building is a pre-fabricated, closed-vault, double-room toilet (see Appendix G– Restroom Design), about 15 feet by 12 feet in dimension, inclusive of the roof and eaves. The peaked roof is about 12 feet high, with 2 ventilation stacks extending to a height of about 15 feet. The excavation needed to accommodate the vaulted structure will be slightly larger in length and width than the building, and about 4½ feet deep. A paved asphalt ramp, graded at less than 5%, will provide access from the entry road and two adjacent ADA-access parking spaces.

2.5.9 Site Q: Project Description

A site-specific plan for restoration of the Big River Rock Quarry site has not been completed. State Parks will contract with the California Department of Conservation, California Geological Survey, to develop site grading and drainage plans and will work with appropriate regulatory agencies, including the North Coast Regional Water Quality Control Board (NCRWQCB), the California Departments of Fish & Game and Conservation, and the County of Mendocino to comply with all regulatory requirements during the planning process and throughout project implementation. .

State Parks proposes to make use of the Big River Rock Quarry pit as a receptacle for bulk excess soil, gravel, and organic debris that may remain from any of the project sites located along the main haul road, M1, possibly including sites M9 and M14. Materials from these sites will be moved by truck along the main haul road during construction periods.

In addition to material from restoration sites, the outside berm along Road M1 at the quarry will be removed and the resulting excess material deposited in the quarry pit. DPR will also remove unstable material from the slopes in and immediately adjacent to the quarry and Road M1, to reduce the potential for rockslides onto the road surface. The material from the unstable slopes will also be deposited into the quarry pit.

DPR will periodically grade the quarry site to compact and stabilize deposits. Exposed, unvegetated soil will be kept from eroding downslope towards Big River at all times; if any material is left at road grade or higher, with the potential to erode onto the road surface or into undisturbed habitat, this material will be appropriately isolated from downslope erosion potential, mulched, and stabilized to prevent its movement off-site.

Once DPR has accumulated sufficient material to complete the grading of the quarry pit, the deposits will be terraced and sloped to facilitate sheet flow across the surface of the deposited fill. The M1 roadbed will be outsloped and graded, and possibly re-contoured if necessary, to allow sheet flow across its surface, and a drainage channel constructed to facilitate bulk flow across the road corridor, including an armored ford, if necessary, where M1 crosses this drainage swale. This artificially constructed channel will be designed to accommodate the maximum runoff expected from the quarry basin. The final quarry grade is dependent on the volume of material deposited; the goal is to

accumulate sufficient material to eliminate the seasonal pool of water in the quarry basin, and to provide some amelioration of both the pitch and height of the extreme slopes along the north wall of the quarry. However, complete elimination of near-vertical faces along that wall is unrealistic without generating more soil volume than is expected from all currently proposed restoration sites in the Big River unit.

DPR will continually assess the status of the fill deposited into the quarry in order to determine when sufficient material has been generated to accomplish the objectives for the site listed above in Section 2.4.9. The final grading plan will be based upon the volume of accumulated fill relative to the achievement of objectives, the near-term potential for the generation of additional fill, such as from restoration sites or road repairs within the park unit, site stability, public safety, site aesthetics, and available funding to complete restoration of the site.

At all stages during the quarry restoration, all exposed soil will be appropriately stabilized with erosion-control materials, such as landscape fabric, straw wattles, and surface mulches (e.g., rice straw, native brush) to prevent significant on-site erosion and off-site sedimentation. Upon completion of surface re-contouring and grading within any designated portion of the site, DPR will plant native plant species for the purpose of providing vegetational continuity with the surrounding forest and riparian corridors. DPR will develop a revegetation plan to accompany grading plans for the quarry site.

2.5.10 Site M1-0: Project Description

State Parks proposes to facilitate improved drainage conditions along the main haul road, Road M1, from mile 0.0 to mile 6.0. In order to reduce the need for ongoing maintenance and frequent repairs of failed culverts and fill-slopes along M1, State Parks will remove outside berms (deposited soil and organic debris) and reduce or eliminate road surface segments constructed entirely on fill. The soil and rock generated from these deposited materials will be re-located along the inboard (upslope) road edges, and graded to create a low-angle outside-draining plane perpendicular to the longitudinal road surface. These activities will, in effect, eliminate the need for, and existence of, inboard ditches that currently carry road surface and upslope surface water and sediment along the inboard road edges. Where possible, elimination of all inboard surface runoff within contained geographical flow basins will allow the elimination of cross-road ditch-relief culverts that require frequent clearing to prevent blockage. In some cases, inboard relief culverts are no longer located in optimal drainage locations, and local drainage shifts have led to bulk flow across road surfaces, pooling water and contributing to road-surface and fill-slope failures. Where possible, some ditch-relief culverts can be replaced with gradual reductions in road surface elevation (rolling dips) or armored stream-crossing fords, or both. In other sites, facilitation of sheet flow across roads may completely eliminate the need for channeling surface runoff across roads.

The reduction or elimination of fill-slopes and filled road surfaces will also reduce the potential for failure of soil surfaces. Road width reductions will allow the remaining road surfaces to occupy more stable configurations on native substrates, and eliminate the sloughing downslope of less stable fill slopes. Soil generated from substantially sized fill

deposits will be used to outslope the road, and excess amounts will be transported to the Big River Rock Quarry site for disposal.

Re-distributed fill materials used to create road outslipping will be compacted and graded to reduce the potential for surface erosion. If necessary, all exposed road surfaces and adjacent slopes will be mulched or brushed to reduce potential erosion.

2.6 PROJECT IMPLEMENTATION

In general, project implementation will include all the activities performed within the Big River unit that are directly related to the site-specific road, riparian corridor, and public entry areas work described above. Implementation includes on-site preparatory measures, such as delineations of active work zones, staging areas, and travel corridors, the posting of safety or educational information and signs, construction and ground-disturbing activities, erosion-control and restoration, monitoring, and maintenance necessary to accomplish project objectives.

Section 2.6.3, Site-Specific Construction Activities, provides brief descriptions of the general construction activities pertinent to each of the 12 project sites. However, greater detail for each site is provided diagrammatically in Appendix B, Project Plan Sheets. More specific technical information on the various stages of streambed and road remediation is located in Appendix C, Standard Specifications & Best Management Practices for Disturbed Lands Remediation (“Specifications”). This appendix provides further detail to explain the work proposed.

2.6.1 Preparatory Activities: All Sites

These actions will precede actual project implementation in all park areas for which visitor access or recreation may be constrained or restricted due to project activities:

- Issuance of park closure notices by the Mendocino District State Parks superintendent;
- Posting of road and area closure notices and educational or safety-related information;
- Flagging and signing of Areas of Potential Effect (APEs), staging areas, travel corridors;
- Inspection and monitoring of active work sites;
- Staging of materials and equipment in designated sites adjacent to restoration sites;
- Where practical, salvage of native plant propagules (stems, rhizomes, or entire plants).

These activities will be implemented continually (daily, in most cases) in all active project areas, staging areas, and travel corridors:

- State Parks job operations supervision;
- Engineering oversight and supervision (including training of on-site construction monitors) by an experienced Project Inspector under the direction of a licensed Engineering Geologist;
- Work site monitoring;
- On-site visitor services and public safety monitoring;
- Equipment cleaning, on-site servicing, etc.;

- Site security (protection of equipment from vandalism, weather, etc.);
- Wildlife impact prevention measures (including mitigation measures).

2.6.2 General Construction and Ground-disturbing Activities: All Sites

General construction and ground-disturbing activities common to multiple sites include the following:

- 1) removal of woody and herbaceous vegetation from sediment wedges, roadbed fill prisms, and, as needed, from adjacent areas to facilitate safe and efficient equipment operations;
- 2) stockpiling of native woody plant material within areas of potential effect, or if necessary, outside construction zones, such as in staging areas;
- 3) transport and burial of bulk non-native plant material to designated disposal sites (may include the quarry);
- 4) excavation of impounded alluvial sediment in riparian channels;
- 5) excavation of fill prisms constituting roadbed stream crossings;
- 6) excavation of road-fill deposits and berms along roads;
- 7) removal of culverts and supporting structures (e.g., introduced steel, concrete, rock, etc.) from riparian channels or fill prisms to off-site waste disposal facilities;
- 8) deposition of excess sediment, road prism fill, or sidecast soil into site-specific targeted areas to restore, in part, historical topography and to restrict off-road vehicle access;
- 9) restoration of historical topography to buried Class II and Class III tributary channel sections;
- 10) construction of bridges above restored streambed channels;
- 11) conversion of shallow streambed crossings and ditch relief culvert crossings to rock-armored roadbed fords or road-base surfaced rolling dips;
- 12) installation of geotextile fabrics, straw wattles, and other materials to reduce erosion on slopes;
- 13) installation of brush, willow wattles, or other materials to augment the introduction of non-native erosion control materials;
- 14) post-construction and long-term environmental monitoring;
- 15) short- and long-term site maintenance of erosion control materials and removal of non-native vegetation;
- 16) installation of native plants, either recently salvaged propagules or nursery-propagated plants from salvaged propagules, where determined to be necessary for the purpose of facilitating vegetative restoration of remediation sites.

While these activities will characterize project implementation at one or more sites, job-specific tasks will vary considerably in scope and detail from site to site. Please refer to site-specific plan sheets for more details.

(Also refer to Appendix C: Standard Specifications & Best Management Practices for Disturbed Lands Remediation).

Travel Corridors and Staging Areas

For all project sites located along the main haul road, M1, and for Sites M9 and M14, the M1 road will provide the primary access corridor for construction-related transportation and movement of equipment. During work activities, appropriate signs

and notices will be provided at the main Big River entrance to alert park visitors to either a) temporary closure of M1 or other roads, or b) the potential for travel of trucks, excavators, and other vehicles along M1. For part of the activities planned for Road M14, access will be along Little Lake Road to either of County Roads 700 and 720 to the Mendocino Woodlands, where these roads connect with Big River Road M14. For Site S22, access will be from Comptche-Ukiah Road directly onto Road S22. For some project activities, movement of equipment on side roads or spurs along Roads M1, M9, M11, M14, and S22 may be necessary.

The primary staging area for all projects will be immediately within the project areas specified. However, additional staging areas for equipment or materials storage may be necessary, as follows:

- For sites along M1 and M9, the quarry landing along Road M1 (Site Q) will be a primary staging area;
- Sites M1-4.78 and M9, the junction of M1 and M9;
- Site M14, the junction of M11 and M14, as well as M14 in the Mendocino Woodlands, south of its junction with County Road 720;
- Site S22, the road surface and spur roads off S22;
- Site Q, the quarry landing along M1;
- Site P1, the Big River parking area.

Other potential staging areas include wide sections of Road M1 and spur roads immediately adjacent to work sites where equipment can be stored close to the project site without impeding traffic flow along the road.

2.6.3 Site-Specific Construction and Ground-Disturbing Activities

2.6.3a Sites M1-0.64, M1-0.7, M1-1.85, and M1-2.05

For Sites M1-0.64, M1-0.7, M1-1.85, and M1-2.05, please refer to Appendix B - Project Plan Sheets, for specific topographical alteration information, and to Appendix C, Standard Specifications & Best Management Practices for Disturbed Lands Remediation, for technical information on site remediation.

2.6.3b Site M1-2.08

For Site M1-2.08, please refer Appendix B - Project Plan Sheets, for specific topographical alteration information, and to Appendix C, Standard Specifications & Best Management Practices for Disturbed Lands Remediation, for technical information on site remediation.

2.6.3c Site M1-4.78

For Site M1-4.78, please refer to Appendix B - Project Plan Sheets, for specific topographical alteration information, and to Appendix C, Standard Specifications & Best Management Practices for Disturbed Lands Remediation, for technical information on site remediation.

2.6.3d Site M1-5.63

For Site M1-5.63, please refer to Appendix B - Project Plan Sheets, for specific topographical alteration information, and to Appendix C, Standard Specifications & Best Management Practices for Disturbed Lands Remediation, for technical information on site remediation.

2.6.3e Site M9

For Site M9, please refer to Appendix B - Project Plan Sheets, for specific topographical alteration information, and to Appendix C, Standard Specifications & Best Management Practices for Disturbed Lands Remediation, for technical information on site remediation.

Scar Area: Terracing, Slope Stabilization, and Revegetation

The implementation of project activities at this site is included in the remedial measures for Site M9, as discussed above. Prior to the start of work at this site, DPR will prepare a revegetation plan providing for erosion control techniques (as discussed in Appendix C, Standard Specifications & Best Management Practices for Disturbed Lands Remediation) and establishment of native plants on the failed slope scar. The PI will supervise the manual labor needed to stabilize and terrace the failed slope below Road M9 prior to revegetation, and a DPR environmental scientist will supervise planting activities.

2.6.3f Site M14-0

The full set of plans for the proposed restoration work along M14.0 (Appendix B) includes location maps, several sheets of station-by-station restoration and remediation tasks, and site-specific maps that correspond to the task sheets. In addition, details of remedial techniques can be found in Appendix C, Standard Specifications & Best Management Practices for Disturbed Lands Remediation

2.6.3g Site S22

The full set of plans for the proposed restoration work along S22 (Appendix B) includes the following: location maps, a list of station-by-station restoration and remediation tasks, five plan sheets, and Appendix C, Standard Specifications & Best Management Practices for Disturbed Lands Remediation.

2.6.3h Site P1

Implementation activities for the entry road and parking areas at the entrance to the Big River unit include the following:

- delivery and storage of approximately 110 tons of boulders;
- placement of those boulders to delineate the previously described parking areas;
- re-paving of the entry road from the base of its descent from Hwy 1., east to the location of the new restroom building;
- resurfacing of designated parking areas with road base gravel;
- installation of regulatory and informational signs at the base of the Hwy. 1 entry road (in the current sign location); and
- installation of regulatory and informational signs in other appropriate and necessary locations in parking lot and beach access areas.

2.6.3i. Site P2

The implementation of restroom installation will include the following:

- excavation (as described above in Section 2.5.8b) of soil to accommodate the vaults and foundation supports for the pre-fabricated building;
- backfilling of native soil around the installation;

- paving of 2 ADA-compliant parking spaces and an ADA-compliant access ramp and walkway from the parking spaces to the restroom building;
- placement and posting of ADA-access signs at the parking spaces; and
- if necessary or desirable, planting of native plants near the building.

The pre-fabricated design of the restroom building will allow its relocation and re-use, if necessary, in the future.

2.6.3j Site Q

The current plan for implementing restoration of the quarry is general in nature, and will be developed more fully, as noted above, in cooperation with requirements and recommendations from state and county regulatory agencies. In general, implementation will include the deposition of several thousand cubic yards of fill material generated from other Big River restoration sites, and the subsequent grading and re-contouring of that soil to achieve, to the degree possible, elimination of the quarry basin and a reduction in the height of the north quarry wall relative to the elevation of the re-contoured basin. The haul road (Road M1) through the quarry will also be re-graded, as needed, to establish outsloping to accommodate sheet flow of precipitation runoff from the restored quarry site. Rock may be imported to the site to provide energy dissipation along the contoured drainage channel through the quarry site, as well as to provide an armored ford across this swale where it intersects the haul road. Ongoing site maintenance (erosion control, non-native species removal) will be complemented with the planting of native plant species on-site subsequent to final site re-contouring.

2.6.3k Site M1-0

Removal of outside berms, road surface fill and fill-slopes along roads, elimination of inboard ditches and ditch-relief culverts, construction of rolling dips and armored fords, and outsloping of road surfaces will be accomplished according to the procedures provided in Appendix C, Standard Specifications & Best Management Practices for Disturbed Lands Remediation.

Essential to implementing removal of berms and fill-slopes and inboard ditches and re-contouring of the road surface is the identification of critical reaches of the road where these objectives can be successfully implemented. Elimination of inboard ditches must be accomplished to avoid the isolation of surface runoff along the road without any functional outlet during the rainy season. Thus, berm and fill removal, road re-contouring, and inboard ditch burial must be designed in a coordinated and systematic fashion, within appropriately scaled geographical units, in order to capture all potential surface runoff in the upslope area into the re-constructed drainage system below. Local elevation change and slope-aspect transition areas must be identified in order to direct water appropriately. Otherwise, surface flow will continue to pool on and erode road surfaces and overwhelm adjacent ditch-relief culverts.

Removal of berms and fill-slopes will be preceded by salvage of any locally significant native plant populations; these plants will be used in post-disturbance restoration. Soils from berms and fill-slopes along the downslope road edges will be re-deposited against the upslope road edges through the use of excavators and bulldozers. Heavy equipment will also be used to remove culverts and to re-contour road surfaces leading into and out of constructed drainage swales and stream fords. Excess material not

used to outslope Road M1 in the immediate area of this remedial work will be transported by dump truck to Site Q, the quarry pit. Immediately upon completion of all surface disturbance activities with a given site, erosion control and slope stabilization measures, as outlined in Appendix C, Standard Specifications & Best Management Practices for Disturbed Lands Remediation, will be implemented.

2.7 VISITATION TO THE BIG RIVER UNIT OF MENDOCINO HEADLANDS STATE PARK

The Big River unit is open year-round to visitors for walking, running, bicycling, horseback-riding, swimming, and other light recreational activities. The main entry area provides the primary access and parking for visitors to the unit, and Road M1 is the most used corridor in the unit for several thousand park visitors each year; visitation is greater during the dry season, typically April through November.

This project will temporarily preclude visitor use of project restoration areas during rehabilitation activities and in some cases, for variable periods thereafter. All projects along M1 will require road closure at project sites; although visitors will not be prevented from using other park areas, the M1 access will not be available for public use during periods of active work.

One of this project's primary objectives is to reduce the maintenance needed to keep M1 and other primary routes through the park open to visitors. Project activities have been designed to reduce the potential for fillslope failures, stream crossing blockages, and erosion of road surfaces. Measures projected to reduce future maintenance needs for M1 and other road surfaces include removal of fill slopes and outside berms, outsliping, and cross-drainage armoring. Other than Road S22, no primary road segment is planned for permanent closure as a result of this project. Road M9, with a large slide having already reduced road width to under 10 feet (as of winter 2004), will not be widened for this project, nor will it be permanently closed to future consideration as a potential motor vehicle route connecting Road M1 to Hi-Chute Ridge and County Road 720. While Road M14 is being converted from "road" to trail, in reality the existing corridor is no longer suitable for passage of any vehicles larger than bicycles or motorcycles, due to landslides, Big River meanders, seasonal sedimentation of the road surface, and encroaching vegetation. Other segments to be "decommissioned" are dead-end road or skid trail spurs leading to logging landings.

In summary, the activities proposed by this project are not anticipated to result in a substantial alteration of visitor use patterns or access to any portion of the Big River unit.

2.8 CONSISTENCY WITH LOCAL PLANS AND POLICIES

This project is consistent with local plans and policies, including the California Coastal Act and local regulations consistent with the federal Clean Water Act, such as Total Maximum Daily Load standards established by the North Coast Regional Water Quality Control Board. The project is also consistent with the California Public Resources Code in that no permanent facilities will be developed as part of this project.

2.9 DISCRETIONARY APPROVALS

DPR has approval authority for the proposed project. The project will require discretionary approval from the California Department of Fish and Game (DFG) in the form of a Streambed Alteration Agreement (SAA). DPR will file an application for the SAA once the Notice of Determination (NOD) has been filed for this project, and DPR will also file an application for a Clean Water Act (CWA), Section 404, permit with the U. S. Army Corps of Engineers, and an application for a CWA, Section 401, permit with the NCRWQCB. NOAA Fisheries will be consulted as part of the Section 404 permitting process. The U.S. Fish and Wildlife Service (USFWS) will review the planned project sites with regard to potential impacts to marbled murrelet and northern spotted owl and their respective habitats. The portion of the project that is within the Coastal Zone will require discretionary approval from Mendocino County Planning and Building through the Coastal Development permitting (CDP) process.

2.10 RELATED PROJECTS

At this time, DPR has no other proposed projects planned for the Big River unit, nor any projects with similar objectives proposed for any other park units within the jurisdiction of the Mendocino District. One potential future project, originally included as part of this larger project, could be planned for the Glenbrook Gulch drainage in the southeastern portion of the unit, in the Albion River watershed. It would include removal of a small earthen dam and significant rehabilitation to the Glenbrook Gulch riparian corridor. The proposal and environmental documentation for that project will be developed once funding can be provided.

CHAPTER 3

ENVIRONMENTAL CHECKLIST

PROJECT INFORMATION

1. Project Title: Big River Watershed Restoration -- Proposition 40 – River Parkways Grant Project
2. Lead Agency Name & Address: California Department of Parks and Recreation
3. Contact Person & Phone Number: Renée Pasquinelli, Sr. Environmental. Scientist (707) 937-5721
4. Project Location: Mendocino Headlands State Park
5. Project Sponsor Name & Address: California Department of Parks and Recreation
Mendocino District Headquarters
State Hwy. 1, Russian Gulch State Park
Mendocino, CA 95460
6. General Plan Designation: New Acquisition
7. Zoning: Timberland Production (TPZ) (Mendocino County General Plan Coastal Element Nov. 5, 1985, Revised March 11, 1991)
8. Description of Project: The California Department of Parks and Recreation (DPR) proposes to correct erosion and sedimentation problems, improve stream crossings along roads, remove logging roads that contribute sediment to Big River and tributaries, convert roads to trails, restore pre-disturbance hydrologic processes, delineate parking areas, construct a restroom building, and improve public information within the Big River unit of Mendocino Headlands State Park. Goals of this project include road de-commissioning and conversion into recreational trails, stabilizing or removing skidtrails and landings to restore riverine functions, improving fish passage and opening up new habitat for spawning and rearing, resurfacing and delineating parking locations, and constructing public toilets. Work related to these efforts will include:
 - Excavation and removal of road fill from stream channels to re-establish historical width, depth, alignment, and gradient;
 - Removal of sidecast fill material along roadsides;
 - Decompaction of road surfaces to facilitate revegetation by native plants;
 - Retrieval and removal of debris (culverts, cable, concrete foundations, etc.) that negatively affect hydrologic processes and natural habitats;
 - Restoration of the natural topography and hydrology of the land (ridges, stream valleys, and swales) along roadway corridors;
 - Removal of non-native invasive plant species;
 - Mulching and implementation of other stabilization techniques in disturbed sites using woody debris recovered from excavations;
 - Monitoring and maintenance of disturbed areas to improve conditions for either human-assisted or natural revegetation with native species;
 - Delineation of beach parking areas with boulders, logs, or other natural material;
 - Resurfacing of the beach parking areas and primary road with compacted road base;
 - Installation of a vault restroom facility outside the 100-year floodplain;
 - Developing and installation of regulatory, informational, and interpretive signs pertaining to restoration efforts.

Specific watershed restoration activities will focus on eleven sites scattered throughout the Big River unit, with the parking area and restroom work comprising a twelfth site.

9. Surrounding Land Uses & Setting: Refer to Chapter 3 of this document (Section IX, Land Use Planning)
10. Approval Required from Other Public Agencies Refer to Chapter 2, Section 2.9

1. ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

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

- | | | |
|--|---|---|
| <input type="checkbox"/> Aesthetics | <input type="checkbox"/> Agricultural Resources | <input type="checkbox"/> Air Quality |
| <input type="checkbox"/> Biological Resources | <input type="checkbox"/> Cultural Resources | <input type="checkbox"/> Geology/Soils |
| <input type="checkbox"/> Hazards & Hazardous Materials | <input type="checkbox"/> Hydrology/Water Quality | <input type="checkbox"/> Land Use/Planning |
| <input type="checkbox"/> Mineral Resources | <input type="checkbox"/> Noise | <input type="checkbox"/> Population/Housing |
| <input type="checkbox"/> Public Services | <input type="checkbox"/> Recreation | <input type="checkbox"/> Transportation/Traffic |
| <input type="checkbox"/> Utilities/Service Systems | <input type="checkbox"/> Mandatory Findings of Significance | <input checked="" type="checkbox"/> None |

DETERMINATION

On the basis of this initial evaluation:

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

I find that, although the original scope of the proposed project **COULD** have had a significant effect on the environment, there **WILL NOT** be a significant effect because revisions/mitigations to the project have been made by or agreed to by the applicant. A **MITIGATED NEGATIVE DECLARATION** will be prepared.

I find that the proposed project **MAY** have a significant effect on the environment and an **ENVIRONMENTAL IMPACT REPORT** or its functional equivalent will be prepared.

I find that the proposed project **MAY** have a "potentially significant impact" or "potentially significant unless mitigated impact" on the environment. However, at least one impact has been adequately analyzed in an earlier document, pursuant to applicable legal standards, and has been addressed by mitigation measures based on the earlier analysis, as described in the report's attachments. An **ENVIRONMENTAL IMPACT REPORT** is required, but it must analyze only the impacts not sufficiently addressed in previous documents.

I find that, although the proposed project could have had a significant effect on the environment, because all potentially significant effects have been adequately analyzed in an earlier EIR or Negative Declaration, pursuant to applicable standards, and have been avoided or mitigated, pursuant to an earlier EIR, including revisions or mitigation measures that are imposed upon the proposed project, all impacts have been avoided or mitigated to a less-than-significant level and no further action is required.

ORIGINAL SIGNATURE ON FILE
Renée Pasquinelli
Environmental Coordinator

Date

EVALUATION OF ENVIRONMENTAL IMPACTS

1. A brief explanation is required for all answers, except "No Impact", that are adequately supported by the information sources cited. A "No Impact" answer is adequately supported if the referenced information sources show that the impact does not apply to the project being evaluated (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on general or project-specific factors (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).
2. All answers must consider the whole of the project-related effects, both direct and indirect, including off-site, cumulative, construction, and operational impacts.
3. Once the lead agency has determined that a particular physical impact may occur, the checklist answers must indicate whether that impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate when there is sufficient evidence that a substantial or potentially substantial adverse change may occur in any of the physical conditions within the area affected by the project that cannot be mitigated below a level of significance. If there are one or more "Potentially Significant Impact" entries, an Environmental Impact Report (EIR) is required.
4. A "Mitigated Negative Declaration" (Negative Declaration: Less Than Significant with Mitigation Incorporated) applies where the incorporation of mitigation measures, prior to declaration of project approval, has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact with Mitigation." The lead agency must describe the mitigation measures and briefly explain how they reduce the effect to a less than significant level.
5. Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR (including a General Plan) or Negative Declaration [CCR, Guidelines for the Implementation of CEQA, § 15063(c)(3)(D)]. References to an earlier analysis should:
 - a) Identify the earlier analysis and state where it is available for review.
 - b) Indicate which effects from the environmental checklist were adequately analyzed in the earlier document, pursuant to applicable legal standards, and whether these effects were adequately addressed by mitigation measures included in that analysis.
 - c) Describe the mitigation measures in this document that were incorporated or refined from the earlier document and indicate to what extent they address site-specific conditions for this project.
6. Lead agencies are encouraged to incorporate references to information sources for potential impacts into the checklist or appendix (e.g., general plans, zoning ordinances, biological assessments). Reference to a previously prepared or outside document should include an indication of the page or pages where the statement is substantiated.
7. A source list should be appended to this document. Sources used or individuals contacted should be listed in the source list and cited in the discussion.
8. Explanation(s) of each issue should identify:
 - a) the criteria or threshold, if any, used to evaluate the significance of the impact addressed by each question and
 - b) the mitigation measures, if any, prescribed to reduce the impact below the level of significance.

ENVIRONMENTAL ISSUES

I. AESTHETICS.

ENVIRONMENTAL SETTING

The Big River unit of Mendocino Headlands State Park, located adjacent to the Pacific Ocean and the town of Mendocino, contains a wide variety of coastal and inland habitats within its 7334 acres. Meandering through the center of the park is Big River itself. The estuary, which extends approximately eight miles upriver, has been described as the longest undeveloped estuary in California. From different points in the park, breathtaking views of wetland, forest, river, and ocean are available.

The majority of the Big River unit is second and third-growth redwood forest. Large stumps and remnant old-growth trees provide testament to the area's pre- and post-logging history. Commercial timber harvest began in the lower Big River in 1852 and continued up into the watershed until the property's acquisition by State Parks in 2002. A network of roads and skid trails, as well as aging and failing watercourse crossings, have resulted from the previous 150 years of logging.

Most elements of the proposed project, such as returning some of the most damaged fill slopes to a natural contour, restoring the natural gradient of streams at watercourse crossings, and replanting native vegetation, will have a positive impact on aesthetic value.

	<u>POTENTIALLY SIGNIFICANT IMPACT</u>	<u>LESS THAN SIGNIFICANT WITH MITIGATION</u>	<u>LESS THAN SIGNIFICANT IMPACT</u>	<u>NO IMPACT</u>
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 type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input checked="" type="checkbox"/>

DISCUSSION

- a) Most portions of the proposed project involve repair, correction, or replacement of existing roads and watercourse crossings, thus the visual change will not be substantial. No impact.
- b) The proposed parking area is the only portion of the project that is within the viewshed of Highway 1, a state designated scenic highway. Trees outside of the Highway 1 viewshed will be removed within the grading areas to restore natural topography. Most of these trees are second- and third-growth trees growing on fill slopes and sediment wedges upstream of

culverts. Post-project planting will occur according to the revegetation plan and will enhance the aesthetic value. The parking area portion of the project will involve maintenance of an existing road, the placement of boulders approximately 2 ½ feet tall at the edge of the parking lot, and the construction of a two-stall restroom. The boulders will block vehicle traffic from accessing the mud flat, coastal scrub, and coastal foredune areas on the northern side of Big River. Restricting vehicles will keep the natural landscape free of tire tracks and scars in the vegetation that are visible from Highway 1. The restroom location was chosen to be outside of the viewshed from Highway 1, and will not have an adverse effect on any scenic vista. Revegetation with native flora, as is proposed for several sites, will enhance the aesthetic value. No impact.

- c) In most project areas, during construction, temporary visual effects will occur. However, the final site conditions will reflect more natural characteristics for an overall improvement in view. The parking area will not be changed substantially from its current visual character and use. Less than significant impact.
- d) Lighting is not an element of this plan and no new light sources will be introduced into the landscape. All construction work will be limited to daylight hours, eliminating the need for work lights. This plan will create no new source of light or glare. No impact.

II. AGRICULTURAL RESOURCES.

ENVIRONMENTAL SETTING

The Big River unit of Mendocino Headlands State Park is surrounded almost exclusively by State Park and State Forest land, commercial timber land, and rural residential properties of various sizes. No portion of the park boundary is used for agriculture or grazing. In addition, no portion of the park is zoned or used as agricultural land or rangeland.

	<u>POTENTIALLY SIGNIFICANT IMPACT</u>	<u>LESS THAN SIGNIFICANT WITH MITIGATION</u>	<u>LESS THAN SIGNIFICANT IMPACT</u>	<u>NO IMPACT</u>
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"/>
c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

* 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 Department of Conservation as an optional model for use in assessing impacts on agricultural and farmland.

DISCUSSION

- a) No Prime Farmland, Unique Farmland or Farmland of Statewide Importance will be converted to non-agricultural use as a result of this project. No impact.
- b) As noted above, no portion of the Park is zoned for agricultural or rangeland use and no conflicts with a Williamson Act contract will be caused by the implementation of this project. No impact.
- c) None of the land adjacent to the Park is farmland or rangeland. The project will not, due to its location or nature, cause any changes in the existing environment that could result in conversion of farmland to non-agricultural use. No impact.

III. AIR QUALITY.

ENVIRONMENTAL SETTING

The project site is within the jurisdiction of the Mendocino County Air Quality Management District (MCAQMD or District), which is responsible for regulating stationary sources of air pollution. The District's boundaries are those of Mendocino County. The project site is also within the jurisdiction of the United States Environmental Protection Agency (USEPA) Region IX and the California North Coast Air Basin (NCAB), which is composed of Mendocino, Humboldt, Trinity, and Del Norte counties and the northern portion of Sonoma County.

In general, air quality in Mendocino County is good, the District being in "attainment" of state and federal air quality standards, at least in part due to its proximity to the Pacific Ocean and robust prevailing northwest winds. However, the District is in "non-attainment" of the state standard for particulate matter (PM₁₀ or particles with an aerodynamic diameter of 10 microns or less and PM_{2.5}, particles with an aerodynamic diameter of 5 microns or less) with no exceedance of the federal standard. A pollutant is designated non-attainment if there was at least one violation of a standard for the specified pollutant within the area boundaries; a pollutant is designated attainment if the state standard for that pollutant was not violated at any site in the area during a three-year period.

Over the 5-year period (1999-2003), Fort Bragg exceeded the PM₁₀ standard a total of 14 days; at least several of these occurrences were related to wildland fires to the north or east of Fort Bragg. Particles less than 10 microns in diameter (PM₁₀) pose a health concern because they can be inhaled into and accumulate in the respiratory system. Particles less than 2.5 microns in diameter (PM_{2.5}) are referred to as "fine" particles and because of their small size can lodge deeply into the lungs and thus pose the largest health risk.

At a local and regional level, air quality along the southern Mendocino coast is considered very good. Very little industry, light traffic, and the low population density, along with the prevailing ocean-borne winds, contribute to the cleanliness of the air.

Scientists have established specific levels of each of 6 common air pollutants that are dangerous to our health and welfare. The California Air Resources Board makes State area designations for ten criteria pollutants: ozone, suspended particulate matter (PM₁₀), fine suspended particulate matter (PM_{2.5}), carbon monoxide, nitrogen dioxide, sulfur dioxide, sulfates, lead, hydrogen sulfide, and visibility reducing particles. In contrast, the U.S. Environmental Protection Agency (U.S. EPA) makes national area designations for five criteria pollutants: ozone (1-hour and 8-hour standards), PM₁₀, carbon monoxide, nitrogen dioxide, and sulfur dioxide. The following table identifies the 2003 and 2004 levels of criteria pollutants in Mendocino County.

Mendocino County Air Quality Designations

	Federal Levels 2003	State Levels 2004
Ozone (2004 Designation)	Attainment	Attainment
Carbon Monoxide	Attainment	Attainment
Nitrogen Dioxide	Attainment	Attainment
Sulfur Dioxide	Attainment	Attainment
Particulate Matter (PM ₁₀)	Non-Attainment	Non-Attainment
Particulate Matter (PM _{2.5})	Non-Attainment	Unclassified
Sulfates	Attainment	Attainment
Lead	Attainment	Attainment
Hydrogen Sulfide	Attainment	Unclassified
Visibility Reducing Particles	Attainment	Unclassified

- U. S. Environmental Protection Agency. 2006. Green Book: Non-Attainment Areas for Criteria Pollutants. <http://www.epa.gov/air/oaqps/greenbk/index.html>
- State of California Air Resources Board. 2006. 2004 State Area Designations. <http://www.arb.ca.gov/desig/adm/adm.htm>

Grading activities may result in temporary increases in airborne dust emissions. These activities are subject to the conditions of Regulation 1, Rule 430 (Fugitive Dust Emissions) of the Mendocino County Air Quality Management District (MCAQMD). In addition, the MCAQMD has permitting requirements related to the use of portable diesel engines for construction activities.

WOULD THE PROJECT*:	<u>POTENTIALLY SIGNIFICANT IMPACT</u>	<u>LESS THAN SIGNIFICANT WITH MITIGATION</u>	<u>LESS THAN SIGNIFICANT IMPACT</u>	<u>NO IMPACT</u>
a) Conflict with or obstruct implementation of the applicable air quality plan or regulation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in 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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Expose sensitive receptors to substantial pollutant concentrations (e.g., children, the elderly, individuals with compromised respiratory or immune systems)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

* Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied on to make these determinations.

DISCUSSION

- a) Work proposed in this plan is not in conflict with or will not obstruct implementation of any applicable air quality plan for Mendocino County, the North Coast Air Basin, MCAQMD, or USEPA Region IX. The organic material generated during implementation of this plan will not be burned. No portable diesel-fueled equipment will be used during the project. No impact.
- b, c) The proposed plan will not emit air contaminants at a level that, by themselves, will violate any air quality standard, or contribute to a permanent or long-term increase in any air contaminant. However, plan construction will generate short-term emissions of fugitive dust (PM₁₀) and involve the use of equipment and materials that may emit ozone precursors (i.e., reactive organic gases [ROG] and nitrogen oxides, or NO_x). Increased emissions of PM₁₀, ROG, and NO_x could contribute to existing non-attainment of PM₁₀ conditions and interfere with achieving the projected attainment standards. Consequently, construction emissions will be considered a potentially significant short-term adverse impact. Implementation of Mitigation Measure Air-1 below will reduce this to a less than significant level. Water application to the soil to control dust shall be conducted in a manner that does not generate any surface runoff into watercourses. Water drafting will be conducted in accordance with the California Department of Fish and Game's Water Drafting Guidelines. Implementation of the following mitigation measures will reduce potential impacts to a less than significant level.

MITIGATION AND CONDITION MEASURES AIR-1

- All equipment engines will be maintained in good condition, in proper tune (according to manufacturer's specifications), and in compliance with all State and federal requirements.
- All equipment engines will be maintained in good condition, in proper tune (according to manufacturer's specifications), and in compliance with all State and federal requirements.
- Traffic speed on unpaved roads will be limited to 15 miles per hour (mph).
- Excavation and grading activities will be suspended when sustained winds exceed 25 mph, instantaneous gusts exceed 35 mph, or when dust from construction might obscure driver visibility on public roads.
- No more than ten pieces of heavy equipment will operate at the sites at the same time. No more than ten service vehicles will enter the project site at one time.
- Soils will be maintained at a moisture level that will not generate dust. Soil wetting shall be conducted in a manner that does not generate any surface runoff into watercourses. Water drafting will be conducted in accordance with the National Marine Fisheries Service, 2001 Water Drafting Guidelines.

- d) The plan will not expose sensitive receptors to substantial pollutant concentrations. Project areas will be closed to public access during construction. No impact.
- e) The repaving aspect of the project will occur within 0.25 miles of the town of Mendocino. At a few locations, grading for stream restoration will occur within 0.25 miles of several residences. Dust control measures will be followed, resulting in no substantial pollutant

concentrations. The proposed work will not result in the generation of objectionable odors that will affect a substantial number of people. No impact.

IV. BIOLOGICAL RESOURCES.

ENVIRONMENTAL SETTING

VEGETATION

The Big River unit contains a diversity of vegetation communities including coastal dunes and strand, coastal scrub, estuary and coastal brackish marsh, freshwater marsh, seep habitats, bogs, red alder riparian woodland, redwood forest, northern mixed evergreen forest, pygmy cypress woodland, bishop pine forest, and disturbed sites. Vegetation maps were developed to correspond with the Vegetation Classification and Mapping Program List of California Terrestrial Natural Communities recognized by the California Natural Diversity Database. As presented in this report, the communities in the Project Area correspond to two levels of the classification system: the general habitat type and, when more information about species composition was available, the floristic vegetation alliance.

One of the sub-project sites contains coastal dune and strand, which is comprised primarily of yellow sand-verbena (*Abronia latifolia*), wild radish (*Rhapanus sativus*), and sea-rocket (*Cakile maritima*). Most of the remaining sites are predominantly redwood (*Sequoia sempervirens*) forest, frequently with an association of Douglas-fir (*Pseudotsuga menziesii*) and tan oak (*Lithocarpus densiflorus*). In some areas of the property, past management has resulted in dense stands of young fir trees, with non-native jubata (pampas) grass dominating former timber landings and other disturbed areas.

Most of the watercourse canopies are red alder (*Alnus rubra*) riparian woodland and contain bay (*Umbellularia californica*), grand fir (*Abies grandis*), red elderberry (*Sambucus racemosa*), cascara (*Rhamnus purshiana*), and understory species such as slough sedge (*Carex obnupta*). In addition, various willow species such as shining willow (*Salix lucida*) and Sitka willow (*Salix sitchensis*) often grow in small stands in the watercourses. Riparian forests at Big River cover broad areas of the floodplains, especially further upriver. Other species present in the riparian forest include stinging nettle (*Urtica dioica*), horsetail and scouring rush (*Equisetum* sp.), bedstraw (*Galium* sp.), and poison oak (*Toxicodendron diversilobum*). For a list of plant species present in the Big River Project Area, see Appendix A, Table 1: *List of Plant Species observed within Project Area of Potential Effect, Big River Unit Landscape Stabilization and Erosion Prevention Project*.

ANIMALS

Based on the number of plant communities and variety of habitat types found on the property, wildlife diversity is likely to be relatively high. Although reptile diversity may be low, shaded seeps and streams and forest habitats on the property likely provide habitat for a variety of amphibians. Common small mammals adapted to forest habitats in this area include deer mice (*Peromyscus maniculatus*) and dusky-footed woodrats (*Neotoma fuscipes*). Several bat species may also occur on the property. Larger mammals known to occur within the Park include gray fox (*Urocyon cinereoargenteus*), coyote (*Canis latrans*), black bear (*Ursus americanus*), river otter (*Lutra canadensis*), bobcat (*Felis rufus*), mountain lion (*Felis concolor*), and black-tailed deer (*Odocoileus hemionus*). Numerous resident and neotropical migrant bird species occur within the Park. Special-status animals, including mammals, birds, fish, and invertebrates are addressed below.

SPECIAL-STATUS ANIMAL SPECIES, PLANT SPECIES AND VEGETATION COMMUNITIES

Sensitive biological resources that occur or potentially occur on the proposed project site are discussed in this section. Sensitive biological resources include the plants and animals that have been given special recognition by federal, state, or local resource agencies and organizations. Also considered are habitats that are listed as critical for the survival of a listed species or have special value for wildlife, and plant communities that are unique or of limited distribution.

All sensitive species and their habitats were evaluated for potential impacts by this project (Appendix D). A query of the California Department of Fish and Game's Natural Diversity Database (CNDDDB) was conducted for sensitive species and habitats within the Mendocino and adjacent (nine-quad search) 7.5-minute USGS quadrangles. Special-status plant species potentially occurring in the same USGS quadrangles were also examined using the California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants of California (CNPS 2005).

For the purposes of this document, special-status species are defined as plants and animals that are legally protected or that are considered sensitive by federal, state, or local resource conservation agencies and organizations. Specifically, this includes species listed as state or federally Threatened or Endangered, those considered as candidates for listing as Threatened or Endangered, species identified by the USFWS and/or CDFG as Species of Concern, animals identified by CDFG as Fully Protected or Protected, and plants considered by the CNPS to be rare, threatened, or endangered (i.e., plants on CNPS lists 1 and 2).

SENSITIVE PLANTS

In April, May, June, and July 2005, ecologists with DPR, Mendocino District, conducted CNPS protocol-level plant surveys in areas potentially affected by proposed project activities. A plant list compiled during these surveys is available in Appendix A.

The Big River unit supports several rare plants and a diversity of habitats that are described below. A list of these species potentially occurring within the project area and an assessment of their habitat is presented in Appendix D.

Abronia umbellata ssp. *breviflora* – Pink Sand-Verbena
CNPS List 1B. This species is associated with coastal dunes. Only the parking area contains suitable habitat for this species, and the species has previously been documented from this site. Currently, vehicles occasionally park in this habitat. The placement of boulders will prevent vehicles from driving on this sensitive habitat.

Agrostis blasdalei – Blasdale's Bent Grass
CNPS List 1B. This species is associated with coastal bluffs, scrub, and coastal prairies. Although several sites contain coastal scrub, it is not habitat typical of the species. This species was not detected during the botanical surveys.

Angelica lucida – Sea-Watch

CNPS List 4. This perennial herb is found in coastal scrub, often on rocky bluffs. In the project area it is found along the main haul road.

Arctostaphylos mendocinoensis – Pygmy Manzanita

CNPS 1B. This species is associated with the pygmy forest habitat community. No habitat occurs within the project site.

Astragalus agnicidus – Humboldt Milk-Vetch

CNPS 1B, California Endangered. This species is found in broadleaved upland forest and north coast conifers forests usually inland from the coast. No plants were detected during the botanical survey.

Blennosperma nanum var. *robustum* – Point Reyes Blennosperma

CNPS 1B, California Rare. This species is found in coastal scrub and prairies. Microsites are usually open coastal bluffs in sandy soil. No plants were detected during the botanical survey.

Boschniakia hookeri – Small Groundcone

CNPS 2. This parasitic perennial herb is limited to North America and more specifically a redwood forest type. No plants were detected during the botanical survey.

Calamagrostis bolanderi – Bolander's Reed Grass

CNPS 4. This species is found in many habitats including coastal scrub, wet meadows, and North Coast coniferous forest. No plants were detected during the botanical survey.

Calamagrostis crassiglumis – Thurber's Reed Grass

CNPS 2. This species is generally found in wet coastal scrub and freshwater marshes. Microsites may include marshy swales within grassland or coastal scrub. No plants were detected during the botanical survey.

Campanula californica – Swamp Harebell

CNPS 1B. This species is found in bogs, fens, and other wet meadows in and around coastal prairie, freshwater marsh, closed cone coniferous forest and North Coast coniferous forest. No plants were detected during the botanical survey.

Carex californica – California Sedge

CNPS 2. This species is associated with closed cone coniferous forests and occasionally coastal prairies, meadows, marshes, and swamps. No plants were detected during the botanical survey.

Carex livida – Livid Sedge

CNPS 1A. This species is presumed extinct in California. Habitat for the species is bogs and fens. No habitat is within the project area.

Carex lyngbyei – Lyngbye's Sedge

CNPS 2. This perennial herb is associated with both freshwater and brackish marshes and swamps located at or near sea level. One occurrence of this plant was found at the edge of Big River at one of the project sites.

Carex saliniformis – Deceiving Sedge

CNPS 1B. This species is found in moist-to-wet open areas in close proximity to the ocean. Only marginal habitat occurs in one of the projects sites within the project area. No plants were detected during the botanical survey.

Castilleja affinis ssp. *litoralis* – Oregon Coast Indian Paintbrush

CNPS 2. This perennial herb inhabits coastal dunes, scrub, and bluff scrub. Habitat for the species occurs in the parking area and adjacent areas. No plants were detected during the botanical survey.

Castilleja ambigua ssp. *humboldtiensis* – Humboldt Bay Owl's Clover

CNPS 1B. This species is found in salt marshes and is documented within the lower reach of the Big River estuary. No plants were detected during the botanical survey.

Castilleja mendocinensis – Mendocino Coast Indian Paintbrush

CNPS 1B. This species occurs on coastal bluffs, scrub, closed cone forests adjacent to the ocean, and coastal prairies. No plants were detected during the botanical survey.

Ceanothus gloriosus var. *exhaltatus* – Glory Bush

CNPS 4. This species is found in chaparral and closed cone coniferous forests. No habitat occurs within the project site.

Ceanothus gloriosus var. *gloriosus* – Point Reyes Ceanothus

CNPS 4. This species is found on coastal bluff scrub and occasionally in closed cone coniferous forests. Marginal habitat occurs in one of the project sites. No plants were detected during the botanical survey.

Chorizanthe howellii – Howell's Spineflower

CNPS 1B, Federally Endangered, California Threatened. This species is found in semi-stabilized soil in sand dunes and coastal bluffs and prairies. The species is not known to occur south of Jug Handle State Reserve, which is located north of the Big River unit. Only marginal habitat occurs in the parking area. No plants were detected during the botanical survey.

Clarkia amoena ssp. *whitneyi* – Whitney's Farewell-To-Spring

CNPS 1B. This species is found in coastal bluff scrub and coastal scrub habitats. No plants were detected during the botanical survey.

Collinsia corymbosa – Round-Headed Chinese Houses

CNPS 1B. This species is found in sand dunes and sandy areas in coastal prairies. Only marginal habitat occurs in the parking area. No plants were detected during the botanical survey.

Cupressus goveniana ssp. *pigmaea* – Pygmy Cypress

CNPS 1B. This species is found in closed cone coniferous forests. Habitat for this species does not occur within the project site.

Erigeron supplex – Supple Daisy

CNPS 1B. This species is found on coastal prairies and coastal bluffs usually in rocky areas

with shallow soil. Habitat for this species does not occur within the project site.

Erysimum menziesii ssp. *menziesii* – Menzies' Wallflower

CNPS 1B, Federally Endangered, California Endangered. This species is found in sand dunes and sandy areas in coastal bluffs between the Ten Mile River and Virgin Creek. Habitat for this species does not occur within the project site.

Fritillaria roderickii – Roderick's Fritillary

CNPS 1B, California Endangered. This species is found in coastal bluff scrub, coastal prairies, and valley and foothill grasslands, usually in clay soils. Habitat for this species does not occur within the project site.

Gilia capitata ssp. *pacifica* – Pacific Gilia

CNPS 1B. This species is found in sandy areas in coastal bluff scrub and prairies. Only marginal habitat occurs in two sites in the project area. No plants were detected during the botanical survey.

Gilia millefoliata – Dark-Eyed Gilia

CNPS 1B. This species is found in sand dunes and in sandy areas in coastal bluff scrub and prairies. Only marginal habitat occurs in one of the project sites. No plants were detected during the botanical survey.

Hemizonia congesta ssp. *leucocephala* – Hayfield Tarplant

CNPS 3. This species is found in coastal scrub and valley and foothill grasslands. No plants were detected during the botanical survey.

Hesperevax sparsiflora ssp. *brevifolia* – Short-Leaved Evax

CNPS 2. This annual species is found in coastal bluff scrub, usually in sandy open areas, rocky areas of this soil, or areas where competition from other plants is low, such as trampled areas or other disturbed areas. No plants were detected during the botanical survey.

Horkelia marinensis – Point Reyes Horkelia

CNPS 1B. This perennial herb is found in sandy coastal flats in coastal scrub and prairies. Only marginal habitat occurs in two sites in the project area. No plants were detected during the botanical survey.

Juncus supiniformis – Hair-Leaved Rush

CNPS 2. This perennial herb is found in bog and fens, marshes and freshwater swamps usually in and around standing water in pygmy forests. Habitat for this species does not occur within the project site.

Lasthenia macrantha ssp. *bakeri* – Baker's Goldfields

CNPS 1B. This perennial herb occurs in grasslands and coastal scrub and openings in closed cone coniferous forests. It is found from Marin to Mendocino Counties along the coast. No plants were detected during the botanical survey.

Lasthenia macrantha ssp. *macrantha* – Perennial Goldfields

CNPS 1B. This species occurs in coastal bluff scrub, coastal dunes, and coastal scrub.

Habitat for this species does not occur within the project area.

Lilium maritimum – Coast Lily

CNPS 1B. This perennial bulb generally occurs in closed cone coniferous forests and also occurs in broadleaf upland forests, coastal prairies, coastal scrub, freshwater marshes and swamps, and North Coast coniferous forests. No plants were detected during the botanical survey.

Lotus formosissimus – Coastal Lotus

CNPS 4. This rhizomatous herb occurs in broadleafed upland forest, coastal bluff scrub, closed-cone coniferous forests, cismontane woodlands, coastal prairies, coastal scrub, meadows and seeps, marshes and swamps, North Coast coniferous forests, wetlands in valley and foothill grasslands, and roadsides. It usually occurs in moist or wet areas in these habitats. No plants were detected during the botanical survey.

Lycopodium clavatum – Running-Pine

CNPS 2. This rhizomatous herb is found in marshes and swamps, lower montane coniferous forests, and wet areas of North Coast coniferous forests, often on edges, openings, and roadsides. No plants were detected during the botanical survey.

Microseris borealis – Northern Microseris

CNPS 2. This perennial herb occurs in wet meadows and seeps and sphagnum bogs at high elevations. In California, it is known from only one occurrence near Lake Prairie. An old collection from Mendocino City is questionable. Habitat for this species does not occur within the project site.

Mitella caulescens – Leafy-Stemmed Mitrewort

CNPS 2. This rhizomatous herb is found in broadleaf upland forests, lower montane coniferous forests, meadows and wet areas in North Coast coniferous forests and alder riparian forests. Two populations of this species were found on two of the project sites. A mitigation plan for their protection is proposed and included as an appendix.

Phacelia insularis var. *continentus* – North Coast Phacelia

CNPS 1B. This annual herb is found in sand dunes and sandy areas of coastal prairies and bluffs. Marginal habitat occurs in one of the sites. No plants were detected during the botanical survey.

Pinus contorta ssp. *bolanderi* – Bolander's Beach Pine

CNPS 1B. This tree species is found in and around the pygmy forest. Habitat for this species does not occur within the project site.

Pleuropogon hooverianus – North Coast Semaphore Grass

CNPS 1B, California Threatened. This California-endemic perennial grass is found in wet open areas of North Coast coniferous forest, broadleaf upland forests, and meadows and seeps from Marin to Mendocino Counties. No plants were detected during the botanical survey.

Pleuropogon refractus – Nodding Semaphore Grass

CNPS 4. This perennial grass is found in riparian areas in North Coast coniferous forests and

in lower montane coniferous forests and meadows. No plants were detected during the botanical survey.

Puccinellia pumila – Dwarf Alkali Grass

CNPS 2. This perennial grass occurs in coastal salt marshes and swamps. Habitat occurs at several sites because salt marshes extend upstream in Big River eight miles. No plants were detected during the botanical survey.

Rhynchospora alba – White-Beaked Rush

CNPS 2. This perennial herb is found in bogs and fens, wet meadows, and freshwater marshes and swamps. No plants were detected during the botanical survey.

Sanguisorba officinalis – Great Burnet

CNPS 2. This perennial herb is found in bogs and fens, wet meadows, marshes and swamps, North Coast coniferous forests, riparian forests and often on serpentine rock. It occurs from Mendocino, Humboldt, and Del Norte Counties and elsewhere northward. Only marginal habitat occurs in the project area. No plants were detected during the botanical survey.

Senecio bolanderi var. *bolanderi* – Seacoast Ragwort

CNPS 2. This rhizomatous herb frequently occurs on river banks and rock walls in North Coast coniferous forests and coastal scrub and in moist areas in open forests. No plants were detected during the botanical survey.

Sidalcea calycosa ssp. *rhizomata* – Point Reyes Checkerbloom

CNPS 1B. This perennial herb is found in freshwater marshes and swamps near the coast. No plants were detected during the botanical survey.

Sidalcea malachroides – Maple-Leaved Checkerbloom

CNPS 1B. This perennial herb is found in broadleaf upland forest, coastal prairies, coastal scrub, and north coast coniferous forests often in disturbed areas. No plants were detected during the botanical survey.

Sidalcea malviflora ssp. *purpurea* – Purple-Stemmed Checkerbloom

CNPS 1B. This perennial herb is found from Marin to Mendocino Counties along the coast in broadleaf upland forests and coastal prairies. No plants were detected during the botanical survey.

Triquetrella californica – Coastal Triquetrella

CNPS 1B. This moss is found on soil in coastal bluff scrub and coastal scrub. Marginal habitat occurs for this species. No plants were detected during the botanical survey.

Usnea longissima – Long-Beard Lichen

No official status, but considered rare locally and indicative of older coniferous forests. This lichen is found in semi-open forests in a variety of coniferous forests. No plants were detected during the botanical survey.

Veratrum fimbriatum – Fringed False-Hellebore

CNPS 4. This perennial herb is found in bogs and fens, and wet areas in coastal scrub,

meadows, and North Coast coniferous forests. No plants were detected during the botanical survey.

Viola adunca – Dog Violet

No official status. Species is the host plant for the federally listed Behren's silverspot butterfly. This perennial species is often found in moist areas in coastal prairies and meadows. No plants were detected during the botanical survey.

Viola palustris – Marsh Violet

CNPS 2. This rhizomatous herb is found in coastal bogs and fens and wet areas in coastal scrub from Mendocino County northward to Washington State. No plants were detected during the botanical survey.

Sensitive Vegetation Communities

Coastal Brackish Marsh – Dominated by perennial, emergent, herbaceous monocots to 2 m tall. Cover is often complete and dense. It is similar to salt marshes and to freshwater marshes with some plants characteristic of each.

Grand Fir Forest – Forest stands dominated by grand fir (*Abies grandis*) and occurring in North Coast coniferous forests usually on north facing slopes.

Mendocino Pygmy Cypress Forest – A closed-cone coniferous forest comprised primarily of Bolander pine (*Pinus contorta* ssp. *bolanderi*) and Mendocino cypress (*Cupressus goveniana* ssp. *pigmaea*) typically occurring on mineral-deficient soils of the Blacklock-Aborigine soil of coastal Mendocino County.

Northern Coastal Salt Marsh – Highly productive, herbaceous and salt-tolerant plants forming moderate to dense cover and up to 1 m tall. Most species are active in summer, dormant in winter. This vegetation is usually found along sheltered inland margins of bays, lagoons, and estuaries. These hydric soils are subject to regular tidal inundation by salt water for at least part of the year.

Red alder riparian forest: mesic, dense stands of vegetation dominated by red alder (*Alnus rubra*), to 75 feet in height. Shrub sub-canopy is typically sparse along frequently disturbed stream reaches, and in higher densities with decreased disturbance frequency (flooding, siltation). Shrub sub-canopy constituents include red elderberry (*Sambucus racemosa*), California wax-myrtle (*Myrica californica*), willows (*Salix* spp.), and numerous herbaceous species (e.g., stinging nettle (*Urtica dioica*), hedge-nettle (*Stachys chamissonis*)).

Sphagnum bog – Dominated by a dense growth of low-growing, herbaceous perennials and low shrubs in cold, highly acidic, permanently waterlogged soils that are low in available nutrients. Peat tends to accumulate without decomposing completely. Occasionally the "soil" is pure peat.

Animals

The following animals were evaluated for potentially occurring within the project area. A list of

these species potentially occurring within the project area and an assessment of their habitat is presented in Appendix D. Site specific, protocol level surveys were conducted during 2005 and 2006 for the federally listed northern spotted owl and marbled murrelet, under consultation with the US Fish and Wildlife Service and California Department of Fish and Game (surveys conducted by Mad River Biologists, under contract to California State Parks). Site specific reconnaissance surveys were conducted for amphibians during 2006.

Mammals

California red tree vole (*Arborimus pomo*) – a California Species of Special Concern - has been documented to occur in the Big River unit. The red tree vole inhabits only coastal coniferous forests that contain Douglas-fir, grand fir, western hemlock, and/or Sitka spruce. It lives, nests, and feeds within the forest canopy. The red tree vole is a dietary specialist, feeding on needles and twigs of Douglas-fir and grand fir. Nests increase in bulk over the years as a series of inhabitants add to it, and consist mostly of fecal material and the resin ducts of fir needles.

Ringtail (*Bassariscus astutus*) – a nocturnal predator that dens permanently in a rock pile, hollow tree, or cliff crevice. Suitable habitat consists of a mixture of forest and shrubland in close association with riparian habitats or rocky areas. The ringtail feeds opportunistically on a wide range of prey including rodents, rabbits, birds, eggs, reptiles, invertebrates, fruit, nuts, and carrion. It is fully protected in California.

Townsend's western big-eared bat (*Corynorhinus townsendii townsendii*) and Pale big-eared bat (*Corynorhinus townsendii pallescens*) – The two big-eared bat subspecies in California. Townsend's western big-eared bat occupies the humid coastal regions of northern and central California, whereas the pale big-eared bat inhabits the remainder of the state. Both subspecies occupy a variety of habitats: coastal conifer and broad-leaf forests, oak and conifer woodlands, arid grassland and deserts, and high-elevation forests and meadows. Within those habitats, mesic sites are most commonly inhabited throughout its range. Small moths, beetles, and other soft-bellied insect prey are taken in flight or by gleaning from foliage. These bats are nocturnal, with peak activity occurring late in the evening; roost sites are caves, tunnels, mines, and buildings. This is a Species of Special Concern in California.

Humboldt marten (*Martes americana humboldtensis*) – This extremely rare or possibly extinct subspecies of the American marten is a state Species of Special Concern. Historically it inhabited areas of mature coniferous forest in the coastal redwood zone, from the Oregon border to Sonoma County. Martens rely on snags and down logs as rest and den sites. Mostly carnivorous, martens feed on a variety of small rodents and other animals, but will also eat fish, eggs, fruits, nuts, and carrion.

Pacific fisher (*Martes pennanti pacifica*) – The fisher is a state Species of Special Concern, as well as a candidate for federal listing. It is particularly associated with mature, heavy stands of mixed tree species with a high percentage of canopy closure, but is also found in second-growth forests and in forest openings. In California, fishers primarily inhabit areas consisting of Douglas-fir and associated conifers. Den sites are typically in cavities high in trees, hollow down logs, rock outcrops, or talus. Its variable diet is mainly carnivorous, but besides small animals it will also eat fish, eggs, fruits, nuts, and carrion.

American badger (*Taxidea taxus*) – Badgers occupy many habitats, particularly treeless grasslands, savannahs, or meadows near a forested area. Friable soil and open, uncultivated ground appear to be the badger's main requirements, and are important for foraging, as many of their prey are dug from their underground burrows. The American badger is a Species of Special Concern in California. Records exist of badgers inland in Mendocino County, though not in the Big River unit.

Birds

Cooper's hawk (*Accipiter cooperii*) – Documented to occur in the project area, this California Species of Special Concern is associated with patchy, second-growth conifer and forested riparian habitats. These habitats are essential for hunting and nesting. Prey includes small birds, mammals, amphibians, and reptiles.

Northern goshawk (*Accipiter gentilis*) – A state Species of Special Concern, confirmed to occur in the project area (in winter, not during breeding). Prefers middle to high elevations and mature, dense conifer forests, but can also be found in lower elevations on the coast, in foothills, and in northern deserts. Dense forested areas interspersed with openings such as meadows and riparian areas are habitat requirements. Snags and dead-topped trees are important for perches in the wooded areas where the goshawk hunts. It feeds mostly on birds, though squirrels, rabbits, and other similarly sized mammals are also taken.

Sharp-shinned hawk (*Accipiter striatus*) – This riparian-associated predatory bird has been observed in the fall in the Big River unit, but not during the breeding season. It typically uses areas with dense forest stands near open areas: roosting in intermediate to high canopy forest, wintering in woodlands, and nesting near water in even-aged, single-layer forest canopy. Its typical prey consists mostly of birds but also included mammals, insects, reptiles, and amphibians. Sharp-shinned hawks are a Species of Special Concern in California.

Tri-colored blackbird (*Agelaius tricolor*) – breeds near freshwater emergent wetlands and feeds mostly on seeds, cultivated grains, insects, and spiders in grasslands or crop lands. A small number of tri-colored blackbirds in peripheral colonies have been documented in Mendocino County. Though not documented in the project area, suitable habitat is present. This is a Species of Special Concern in California.

Golden eagle (*Aquila chrysaetos*) – A fully protected Species of Special Concern in California. The golden eagle needs open terrain (such as grasslands, deserts, savannahs, and early successional stages of forest and shrub habitats) for hunting lagomorphs, rodents, and other small animals. Typically found in mountain areas, rolling foothills, desert, and sage-juniper flats. Large trees, or secluded cliffs with overhanging ledges, are used for cover. Golden eagles are documented to occur in the project area.

Marbled murrelet (*Brachyramphus marmoratus*) – Listed as federally threatened and state endangered, the marbled murrelet has only recently been detected in the Big River unit. This small seabird spends most of the year at sea, near the shore, feeding on zooplankton, squid, and fish. Marbled murrelets most often nest in trees, and are closely associated with old-growth and mature forests during their breeding season. Murrelets have also been known to

nest in younger forests that have suitable platforms. At some sites, a very low density of residual large trees, or small patches of suitable habitat within larger areas of unsuitable habitat, were sufficient for occupation by murrelets.

Vaux's swift (*Chaetura vauxi*) – A state Species of Special Concern. This cavity-nesting species is found in redwood and Douglas-fir habitats where the most important habitat requirement appears to be large hollow trees and snags for nest sites. It feeds exclusively on flying insects, with an apparent preference for foraging over rivers and lakes.

Northern harrier (*Circus cyaneus*) – Often associated with flat, open areas such as grasslands, meadows, open rangeland, and fresh and saltwater emergent meadows, the northern harrier is a Species of Special Concern in California. Nests on the ground in shrubby vegetation, usually at a marsh edge, from April to September. Small mammals, birds, amphibians, reptiles, and occasionally fish, make up the harrier's diet.

Yellow warbler (*Dendroica petechia brewsteri*) – This neotropical migrant is a Species of Special Concern in California. Riparian habitats (consisting of alder, willow, cottonwood and other small deciduous open canopy woodland trees or shrubs) are important for breeding. May also breed in montane shrubbery, in open conifer forests. During migration, yellow warblers use sparse to dense woodland, forest, and shrub habitats. Diet consists mainly of insects and spiders.

American peregrine falcon (*Falco peregrinus anatum*) – Endangered and fully protected in the state of California but federally delisted by USFWS since 1999. The peregrine falcon feeds on a variety of birds, and occasionally mammals, insects, and fish. Riparian areas and coastal and inland wetlands are important habitats, especially during the non-breeding season. Protected cliffs and ledges, preferably near water, are necessary for cover and nesting. Fall bird surveys have detected the peregrine falcon in the project area.

White-tailed kite (*Elanus leucurus*) – Fully protected in the state of California. Often found near agricultural areas, and in herbaceous stages of most habitats. Prey are primarily small diurnal mammals, but also include birds, reptiles, amphibians and insects. Trees with dense cover, especially near grassy, open foraging areas, are important for cover and nesting.

Bald eagle (*Haliaeetus leucocephalus*) – Federally threatened and fully protected in the state. In California, the bald eagle typically nests in mountain and foothill forests and woodlands near rivers, lakes, and reservoirs. Bald eagles require large bodies of water, or free flowing water, adjacent to snags or other perches. Fish, waterfowl, and carrion are their main food sources. Bald eagles have been frequently documented in Mendocino County. Though suitable habitat exists in the Big River unit, nesting has not been documented to occur there.

Yellow-breasted chat (*Icteria virens*) – A California Species of Special Concern, the yellow-breasted chat is a neotropical migrant. Brushy riparian thickets are required for nesting and cover. The breeding season is early May to early August. Though appropriate habitat is abundant, there do not appear to be records of yellow-breasted chat in the project area. The birds are considered uncommon on the coast of northern California.

Osprey (*Pandion haliaetus*) – Documented to occur in the project area during breeding, the

osprey is a state Species of Special Concern. Habitat requirements include mixed-conifer habitats near a large, fish-bearing body of water. Nest is a platform of sticks constructed on a large snag, dead-topped tree, cliffs, or manmade structures; occasionally nest may be on the ground. Prey is mostly fish, though mammals, birds, amphibians, reptiles, and invertebrates are also eaten.

Purple martin (*Progne subis*) – A California Species of Special Concern. Often found in open, multi-layered, old-growth forest and woodland with snags during breeding season. Riparian, forest, and woodland areas are important for foraging on insects. Nesting occurs from April to August; nest sites are usually an old woodpecker cavity in a tall, isolated tree or snag.

Northern spotted owl (*Strix occidentalis caurina*) – Federally Threatened and a California Species of Special Concern. Northern spotted owls occupy dense, multi-layered mixed conifer, redwood, and Douglas-fir habitats; they currently and historically occur and breed in the Big River unit. Habitat requirements include a permanent water source near suitable nesting trees or snags, in a block of 100-600 acres. In northern California, spotted owls appear to prefer narrow, steep-sided canyons with north-facing slopes. Its diet consists mostly of small mammals, including bats, but also birds and large arthropods.

Reptiles and Amphibians

Western tailed frog (*Ascaphus truei*) – The tailed frog is a Species of Special Concern in California. Found in stands of mixed conifer, Douglas-fir and redwood; more often in mature or late-successional habitats than in younger ones. Tadpoles feed mostly on diatoms; as adults, insects, spiders, and snails make up the bulk of its diet. Adult tailed frogs occur in low-temperature intermittent to permanent streams. However, most life history requirements are associated with permanent streams for winter hibernation and tadpole development.

Western pond turtle (*Clemmys marmorata*) – A state Species of Special Concern, consisting of two subspecies: the subspecies known to occur in the project area is the northwestern pond turtle (*Clemmys marmorata marmorata*). The western pond turtle is typically associated with permanent ponds, lakes, streams, or irrigation ditches, or permanent pools along intermittent streams, with some shallow-water habitat. This aquatic turtle is believed to leave the water to reproduce, to aestivate, and to overwinter, though activity patterns vary throughout its range and are poorly understood. A variety of aquatic habitats are utilized, usually consisting of vegetative cover and exposed basking sites such as logs and boulders. As opportunistic dietary generalists, pond turtles consume a variety of slow-moving aquatic invertebrates, carrion, and aquatic vegetation. Breeding typically occurs in April or May, and eggs are deposited in a shallow depression in May or June.

Del Norte salamander (*Plethodon elongates*) – Known to occur in nearby counties, this California Species of Special Concern has not been documented in the project area. In the areas where it is found – the Douglas-fir, redwood, and coastal forests of northern California – the Del Norte salamander is most abundant in old-growth forest. Rotting logs, slabs of bark, or stable talus slopes in damp but not wet areas are necessary as cover. The Del Norte salamander feeds on a variety of invertebrates. Eggs are laid in spring, and hatch from fall to early winter.

Northern red-legged frog (*Rana aurora aurora*) – the locally occurring subspecies of the red-legged frog, a California Species of Special Concern. The red-legged frog inhabits calm pools of streams, lakes, marshes, and ponds, preferring shorelines with extensive vegetation. Although the aquatic larvae are mostly herbivorous, adults forage on aquatic and terrestrial insects, crustaceans and snails, as well as worms, fish, tadpoles, and smaller frogs. Red-legged frogs can be seen near water during the breeding season and when not breeding in moist terrestrial environments. Breeding takes place from March to July; females lay eggs in clusters attached to vegetation below the surface of the water.

Foothill yellow-legged frog (*Rana boylei*) - This state Species of Special Concern occurs in or near rocky streams in a broad variety of habitats, and is confirmed to be present in the mixed conifer and riparian habitats of the Big River unit. Submerged rocks or sediments in stream or onshore are used as cover if disturbed. Eggs are attached to rocks or gravel in moving water near stream margins from late March to early June. Adults eat aquatic and terrestrial invertebrates and tadpoles probably graze on algae and diatoms.

Southern torrent salamander (*Rhyacotriton variegatus*) - a California Species of Special Concern, is found in cold, well-shaded permanent streams and spring seepages in wet or mesic coastal old-growth habitats. In the water it appears to prefer rocky substrates, and on land it is believed to stay within the splash zone or on moss-covered rocky surfaces with trickling water. Courtship is thought to occur over an extended period from October to July, with peak egg-laying in late spring or early summer. It feeds on small insects and spiders. Though little is known of the life history of this salamander, it is likely that they enter a period of aestivation between May and September.

Fish

Tidewater goby (*Eucyclogobius newberryi*) – Federally Endangered and a California Species of Special Concern. Required habitat for this species is brackish shallow lagoons, or lower reaches of coastal streams, where the water is fairly still but not stagnant. Its diet consists of small crustaceans, aquatic insects, and molluscs. Though the tidewater goby appears to reproduce year-round, there are distinct peak spawning periods. The tidewater goby has not been documented in the Big River unit.

Pink salmon (*Oncorhynchus gorbuscha*) – This Species of Special Concern is possibly extirpated from most of California, and has not been documented in the project area. For spawning, they prefer clean, coarse gravel in shallow pools and riffles with moderately fast currents. In California, spawning has only been recorded in October. Most juveniles do not remain in fresh water long enough to feed; those that do have been known to feed on aquatic insects. At sea, juveniles feed on small crustaceans and other invertebrates, whereas adults feed mostly on fish, squid, krill, copepods, and amphipods.

Coho salmon (*Oncorhynchus kisutch*) – In this portion of the species range, Coho salmon are listed as federally endangered and a State Species of Special Concern. Coho have been documented as occurring in the project area. In California, it is found in many of the short coastal drainages, and the lower sections of larger drainages, south to Monterey Bay. Heavy late autumn or winter rains prompt adults to move upstream to spawn, usually after their second, but sometimes after their first or third, season in the ocean. Optimum habitat for fry

include a mixture of pools and riffles, low amounts of fine sediment, and abundant in-stream and bank cover. At different life stages, prey consists of differing proportions of various larvae, insects, crustaceans, other invertebrates, and fish.

Navarro roach (*Lavinia symmetricus navarroensis*) – One of seven subspecies of the California roach designated as state Species of Special Concern. This omnivore feeds mostly on filamentous algae, crustaceans and aquatic insects. The California roach is most often found in small, warm intermittent streams or isolated pools, though it also occurs in larger and cooler streams, as well as human-modified habitats. The Navarro roach is known to occur in the Russian River and the Navarro River, but has not been documented in Big River.

Steelhead trout and Summer-run steelhead trout (*Oncorhynchus mykiss irideus*) – The summer-run population of this species, which spawns in spring or summer, is a state Species of Special Concern and a candidate for federal listing. The remainder of the naturally spawned northern California population, which typically spawns from December to April, is federally threatened. Steelhead trout are generally 4 or 5 years old when they first spawn, and many may spawn more than once before they die, but usually not more than twice. Permanent small streams or tributaries with low sediment, a gravel bottom, adequate flow, and cool, clear water are necessary for spawning.

Chinook salmon (*Oncorhynchus tshawytscha*) – Federally threatened in this portion of its range, the Chinook has no special state status. Adults feed mostly on fishes; juveniles feed opportunistically on terrestrial and aquatic insects in fresh water, and at sea they forage on crustaceans and other benthic invertebrates. Spawning occurs in large to medium rivers with cool water and riffles with coarse gravels to small cobble substrate. Streams near the upper temperature limit may be tolerated if areas of refuge are present.

Invertebrates

Pomo bronze shoulderband (*Helminthoglypta arrosa pomoensis*) – No status under federal or state endangered species act. However, it was formerly a federal Species of Concern (list is no longer maintained), and California Natural Diversity Database (CNDDDB) ranks this snail species as being extremely endangered and limited in distribution. The pomo bronze shoulderband is associated with duff in North Coast coniferous and redwood forests. Very little information exists for this species.

Lotus blue butterfly (*Lycaeides argyronommon lotis*) – A federally endangered, possibly extinct species. The lotus blue butterfly requires coastal bog habitat with *Lotus formosissimus* plants, which are thought to support the development of this butterfly. It is suspected that the Lotus blue butterfly uses either coast trefoil (*Lotus formosissimus*) or Bolander's sweet pea (*Lathyrus vestitus* ssp. *bolanderi*) as larval foodplants. The lotus blue is not documented to occur in the project area.

Behren's silverspot butterfly (*Speyeria zerene behrensi*) - Coastal terrace prairie is its required habitat. *Viola adunca* is the sole larval food plant for this species, which is therefore a habitat requirement. Adults feed on the nectar of the *Viola* and other species. The project area is outside of the published range for Behren's silverspot, and *Viola adunca* has not been

observed during botanical surveys in the Big River unit.

California freshwater shrimp (*Syncaris pacifica*) – Federally and state endangered. Not documented to occur in the project area, this crustacean is known to inhabit streams in other nearby coastal counties. The California freshwater shrimp prefers the areas surrounding undercut banks of 6 inches or greater, in streams 12-36 inches in depth, with exposed live tree roots and overhanging woody debris or stream vegetation. Detritus is its main food source.

	<u>POTENTIALLY SIGNIFICANT IMPACT</u>	<u>LESS THAN SIGNIFICANT WITH MITIGATION</u>	<u>LESS THAN SIGNIFICANT IMPACT</u>	<u>NO IMPACT</u>
WOULD THE PROJECT:				
a) Have a substantial adverse effect, either directly or through habitat modification, on any species identified as a sensitive, candidate, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or the 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, or regulations, or by the California Department of Fish and Game or the U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Have a substantial adverse effect on federally protected wetlands, as defined by §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 type="checkbox"/>	<input type="checkbox"/>	<input checked="" 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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input 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"/>

DISCUSSION

a) A primary goal of road rehabilitation is the improvement of habitat for, and protection of, rare, threatened, and endangered species. The plan will be conducted in compliance with all applicable state and federal threatened and endangered species protection laws and regulations. Work under this plan incorporates all relevant DFG recommendations to avoid or minimize impacts to rare, threatened, or endangered species. In addition, DPR will obtain a Streambed Alteration Agreement (SAA) from DFG for each watercourse crossing, a process that includes consultation among DFG and several federal regulatory agencies. Recommendations from NOAA Fisheries, which enumerate protection measures for coho salmon and their habitat, will be conditions of the SAA. In addition, this project will use the methodology outlined in DFG’s Stream Restoration Manual, for which NOAA Fisheries was consulted, and into which their recommendations were incorporated.

Plants

As indicated in the Environmental Setting above, several sensitive plant species exist in the park. Activities conducted as part of this plan such as brush clearing and excavation of the road prism have the potential to cause a significant impact to one or more of these sensitive species. Implementation of the mitigation measures listed below will reduce any potential impact to a less than significant level.

Angelica lucida – Sea-Watch. Although this species is within the area of potential effect, it is growing on the rocky bluffs above and below the main road where no activities will take place. No grading, material storage, or other maintenance activities are scheduled for this area. If any change is scheduled for this area, the stands of sea-watch will be flagged and avoided. No impact.

MITIGATION AND AVOIDANCE MEASURES – BIO-1 (PLANTS)

***Carex lyngbyei* – Lyngbye's Sedge**

- The location of Lyngbye's sedge occurs at the outer edge of one project site. It is not within the proposed grading area and the soil will not be disturbed. To avoid disturbances, such as brush piling, the stand will be flagged for avoidance.

***Mitella caulescens*– Leafy-Stemmed Mitrewort**

- Two project sites contain this species. A mitigation plan (Appendix G) for transplantation is proposed for these areas of stream channel restoration. Execution of the mitigation plan is expected to reduce project-related impacts to a less-than-significant level.

Sensitive Vegetation Communities

The nature of stream channel restoration requires vegetation removal within the channel to excavate years of accumulated sediments trapped behind undersized culverts. Often, red alder riparian forests are growing within the channel. The following mitigation will reduce the effects to a level less than significant.

MITIGATION MEASURE – BIO-2 (VEGETATION COMMUNITIES)

Red Alder Riparian Woodland

- Site restoration will begin with all measures necessary to control erosion and sedimentation as specified in “Standard Specifications & Best Management Practices for Disturbed Lands Remediation” (California Geological Survey 2005). Implementation of these measures will start during all construction and ground-disturbing activities at each site, and will be sustained until soil stability and 90% vegetational cover has been re-established, as determined by field observations during post-project monitoring.

- Primary on-site erosion-control methods will include one or more of the following
 - The installation of organic erosion control materials (weed-free rice straw, weed-free rice straw wattles, jute) or synthetic materials, such as landscape fabric
 - slash bundles, willow wattles, or other on-site vegetative material anchored on slopes, within stream corridors, along road edges, etc., to effect a reduction in movement of soil into streams or otherwise off-site
- Prior to the start of restoration at all sites, vegetation, ground cover, and physical data will be collected by State Parks natural resources staff to establish baselines for an array of environmental parameters. Data collection will be both quantitative (transects, plots, or relevé assessments) and qualitative (photographic).
- Erosion control and sediment reduction measures will remain in place for the duration of the site monitoring and maintenance period for each site; removal of devices or materials used for these purposes will be dependent upon the achievement of goals and objectives for slope stability, streambed characteristics, water quality, and vegetational composition and cover.
- Removal of invasive, non-native plants by any of the following:
 - Manual removal (preferred)
 - Mechanical removal
 - Manual treatments (e.g., tarping)
 - Herbicide treatments (e.g. Glyphosate)
- Revegetation of disturbed areas (either exposed soil or vegetation dominated by invasive, non-native plants) with native plant species, either from seed collected and sown on-site, or from nursery-propagated native plant material.
- Monitoring and site maintenance of both erosion control materials and non-native plant species will continue until a site has achieved a minimum native plant cover of 50% and surface runoff does not carry sediment from the site, and as determined by State Parks natural resources staff, regulatory agencies' staff, or professional scientists contracted for the purposes of assessing restoration goals.

Northern Coastal Salt Marsh, Coastal Brackish Marsh

- The restoration activity will take place outside of the rainy season. However, to ensure no sediment is transported off site and into the salt marsh and river, silt fencing will be placed downstream of the work area. Any accumulated sediment will be removed and transported off site.

Mammals

There are no suitable roost areas for the potentially occurring big-eared bat species in the vicinity of project areas. In addition, since big-eared bats are nocturnal, and work will occur during daylight hours, no impact is anticipated.

Potential habitat does exist in the project area for mammals that use or construct nests or dens; mitigations for these animals are addressed below.

MITIGATION MEASURES BIO-3 (MAMMALS)

Red Tree Vole

- Prior to operations, the project inspector (PI) or park staff shall be instructed by State Park biologists in the identification of red tree voles and red tree vole nests. Trained Park staff or PI will inspect project areas before construction is to begin, and will monitor each site during construction. Any red tree vole nests encountered at the work site will be flagged and avoided during construction, to the extent practicable.

Ringtail, Humboldt Marten, Pacific Fisher

- Prior to operations, the PI or park staff shall be instructed by State Park biologists in the identification of ringtail, marten, and fisher and their dens. Trained Park staff or PI will inspect project areas before construction is to begin, and will monitor each site during construction. Any ringtail, marten, or Pacific fisher dens encountered at the work site will be flagged and, to the extent practicable, avoided during construction.

Birds

Northern spotted owl (NSO) records from surveys conducted when the Big River property was under previous ownership established that NSO were present. During surveys in 2005, Mad River Biologists (MRB) found that at least 5 historical and new activity centers were occupied; two of those were confirmed to be occupied by nesting pairs. MRB will continue protocol-level surveys in 2006.

In 2005, suitable marbled murrelet (MAMU) habitat was identified and protocol-level surveys performed in the Big River unit, but no murrelets were detected. However, during a northern spotted owl survey, Mad River Biologists made an incidental detection of a marbled murrelet. Subsequently, MRB conducted 20 surveys (10 morning and 10 evening), which resulted in two additional detections. All of the detections were of non-vocalizing birds, in the evening or in the morning, prior to protocol survey start times. These characteristics have been linked to reproductive murrelets near nest sites.

In addition, the Big River unit provides potential habitat for other raptors, and cavity nesting birds. Addressed below are the species expected to occur; species such as the northern harrier, golden eagle, and bald eagle were not addressed due to a lack of suitable habitat in

project areas.

The following mitigation measures will be implemented to reduce any potential impacts to a less than significant level.

MITIGATION MEASURES BIO-4 (BIRDS)

Northern Spotted Owl

- Absence of northern spotted owl (NSO) surveys – if NSO surveys are not conducted then the following conditions shall apply.
 - No trees 12” dbh or greater shall be removed.
 - No operations shall occur from February 1 through August 31. Depending on the proposed action, the August 31 date may be modified to July 10 through a request for Technical Assistance from the US Fish and Wildlife Service (USFWS).
- If trees 12” dbh or greater are to be removed then the following shall apply.
 - No operations shall occur unless a valid NSO Technical Assistance has been obtained from USFWS. The results of the Technical Assistance may result in modification of the standard protection measures stipulated under Item C below.
 - Surveys for the NSO will be conducted in conformance with accepted USFWS approved NSO survey protocols. A map showing the locations (if any) of known NSO activity centers during the past 3 years will be obtained. An activity center is defined as a site identified through protocol-level surveys with the presence of nesting, pair status, or resident single status as defined in the NSO protocol (USFWS 1992). The final determination of an activity center will be made by the USFWS.
 - If any known activity center occurs within 1,000 feet of the proposed action then the following standard protection measures shall apply (these measures may be subsequently changed through technical assistance with the USFWS).
 - a. A buffer zone for NSO shall be established within a 1,000 foot radius of a tree or trees containing a nest or supporting an activity center.
 - b. At no time shall operations occur within a 500 foot radius of an activity center. Within the 500 foot to 1,000 foot spatial buffer, the minimum habitat requirements of functional roosting habitat (minimum 60% canopy, average stand trees >11” dbh) shall be maintained.
 - c. A ¼ mile temporal buffer shall be established around any active activity center during the NSOs critical period which occurs from February 1 through August 31. During the critical period no operations shall occur within the temporal buffer.

Generic Falconiformes

- Pursuant to Fish and Game Code §3503.5, it is unlawful to take, possess,

or destroy any birds in the order Falconiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any other regulation adopted pursuant hereto. Therefore prior to operations, the project inspector (PI) or park staff will be instructed in the identification of raptor nests (both occupied and unoccupied) and raptor breeding behavior. During operations the inspector will be responsible for assuring that no raptor nests are impacted by the proposed treatments by implementing the following measures:

- If an unoccupied raptor nest is detected (during the generic critical period of January 15 through August 31), the nest tree and surrounding screen trees will not be disturbed and the location will immediately be reported to the Senior Environmental Scientist.
- If an unoccupied raptor nest is detected outside of the generic critical period then operations will cease in the vicinity of the nest and its location will be reported immediately to the Senior Environmental Scientist. The Senior Environmental Scientist or designee will then attempt to determine the species of raptor that constructed or used the nest and then the measures stated below under Item C will be applied (based on the species).
- If an occupied raptor nest is detected in the project area, then the PI will cease operations within ¼ mile of the raptor nest (unless it is known to be a peregrine falconerie, in which case a 1 mile buffer will be applied) and immediately notify the Senior Environmental Scientist. The Senior Environmental Scientist or designee will then determine the species of raptor and then the following measures will be applied (based on species).

Species	Critical Nesting Period	Temporal (disturbance) Buffer	Spatial (habitat) Buffer
Accipitridae			
Northern goshawk	March 1 – August 31	400 m (.25 mile)	50 m (165 feet)
Cooper's Hawk	March 1 – August 31	400 m (.25 mile)	30 m (100 feet)
Sharp-shinned hawk	March 1 – August 31	400 m (.25 mile)	30 m (100 feet)
Pandionidae			
Osprey	February 15-August 31	400 m (.25 mile)	30 m (100 feet)
Falconidae			
American peregrine falcon	January 15-August 31	1.6 km (1 mile)	150 m (500 feet)

- DPR may consult with the California Department of Fish and Game on site-specific mitigation measures. Any such changes will be amended into the Mitigated Negative Declaration if necessary.

Generic cavity nesting birds

- Prior to operations, the project inspector (PI) or Park staff will be instructed in the identification of cavity nesting birds and their nests. Project areas will be surveyed by trained

Park staff or the PI before construction is to begin. During construction, disturbed areas will be monitored for the presence of cavity-nesting birds and their nests. If an occupied nest is detected, the nest tree will be flagged and avoided during construction, to the extent practicable.

Amphibians and Reptiles

There is the potential to disturb amphibians and reptiles during construction. The following mitigation measures will be implemented to reduce impacts to a less than significant level.

MITIGATION MEASURE – BIO-5 (AMPHIBIANS AND REPTILES)

- State Park biologists, or Park staff or project inspector (PI) trained by State Park biologists to identify potential habitat and trained in species identification, will survey project areas during summer months before and immediately before construction is to begin. During construction, disturbed areas will be monitored for the presence of amphibians and reptiles and any that are found will be relocated into adjacent undisturbed areas. At stream crossings where stream diversion is necessary, dewatered areas will be visually inspected for the presence of amphibians and reptiles, and any present will be captured and released upstream. Habitat consisting of seeps, springs, or inside ditches containing surface water will also be surveyed for amphibians and potential *Rhyacotriton variegates* habitat. Habitat will be flagged to minimize direct impacts.
- A 4-tier protocol (Welsh and Hodgson 1997) adapted to the project will be used at each site to potentially detect all possible species. A standardized protocol will allow for comparisons between future pre- and post-restoration and also comparisons between impacted and non-impacted channels in the lower Big River watershed. Primary modifications to this protocol involve reducing stream reaches from 900 ft. to 400 ft. (200 ft. upstream and downstream at each water crossing); 400 ft. is the maximum stream distance encompassing the Area of Potential Effect. Increasing the surveying distance would not be applicable to this project due to the topography, dense vegetation, and proximity to Big River, which would inhibit a potentially longer reach.
 - The 1st tier survey is a visual encounter survey (VES). This survey involves walking the survey reach and noting all amphibian and reptile sightings.
 - The 2nd tier survey is executed after a VES is completed. A map will be made depicting fast and slow aquatic habitats and 3 foot belts, 200 ft. above and below the road crossing. Two of the 66 belts will be randomly chosen in order to do area-constrained searches (ACS), one in fast aquatic habitats and one in slow aquatic habitats. If no fast water exists then only two slow water habitats will be surveyed. ACS requires a systematic search of the belt, removing substrate while using hand held nets for animal captures.
 - The 3rd tier, which is modified from Welsh and Hodgson

(1996), will require one additional belt to be chosen in what appears to be high-quality habitat for aquatic amphibians. This will preferably be accomplished in a seep or spring entering the main channel or if non-existing, then within the main channel.

- The 4th tier will begin immediately before construction and will be conducted on project sites with both channel and upland habitats. This survey involves a 30 minute upland search within the potential area of effect and a quick survey of the channel, preferably in habitats where animals were found (noting time spent searching). All animals found during the fourth tier and during construction will be relocated in suitable habitats.

Fish

The majority of the stream crossings are located on ephemeral (class 3) or seasonal (class 2) watercourses that do not offer fish habitat and will be dry during excavation. However, there is the potential for a significant impact to downstream fish populations or their habitat due to siltation and/or turbidity in areas with running water during construction, specifically where known or potential fish habitat will be downstream from crossing removal sites. Implementation of the following mitigation measures will reduce any potential impact to a less than significant level.

MITIGATION MEASURE – BIO-6 (FISH)

- Stream crossing excavations do not occur on fish-bearing streams and they will take place in dry channels or in channels where stream flow is diverted around the excavation sites. Excavations have been designed to limit negative effects on water quality to the maximum extent practicable.
- In some crossings, where the stream is flowing at a slow rate and cannot be captured and diverted, filter structures will be installed downstream to filter turbid discharge from the work site. In other crossings, where flow is sufficient to be intercepted, a small diversion dam will be built upstream and stream flow piped around the worksite and discharged into the stream below the worksite.
- Streams and riparian zones will not be used as equipment staging or refueling areas. Equipment will be stored, serviced, and fueled away from streams and riparian areas. Heavy equipment will be cleaned (e.g., power washed, steamed) prior to being used below the ordinary high water mark.
- Post-construction erosion control has been incorporated into the plans for each project where road surfaces or slope areas will be disturbed. Disturbed areas adjacent to stream channels will be seeded with native plants under the direction of DPR and then erosion control blankets will be anchored on all disturbed slope areas. Alternatively, disturbed soil may be mulched with masticated native brush, trees, and/or slash

generated during the clearing phase of the rehabilitation work. Disturbed road areas will be surfaced with angular gravel to a minimum thickness of 4 inches.

- DPR will ensure that contract(s) associated with the project contain all of the relevant BMPs (best management practices), and other descriptions of measures identified in this mitigated negative declaration and in other documents associated with consultations for this project as necessary to avoid or minimize incidental take of listed fish species.

Invertebrates

There is the potential to disturb amphibians and reptiles during construction. The following mitigation measure will be implemented to avoid impacts.

MITIGATION MEASURE BIO-7 (INVERTEBRATES)

Pomo bronze shoulderband

- Park staff or project inspector (PI) trained to identify potential habitat, and trained in species identification, will survey project areas immediately before construction is to begin, relocating any pomo bronze shoulderband snails discovered. During construction, disturbed areas will be monitored for the presence of the pomo bronze shoulderband snail. Any that are found will be relocated into adjacent, suitable, undisturbed areas.

- b) Because most of the restoration projects are located at road crossings over stream channels, much of the work involves manipulation of riparian vegetation. It is necessary to remove the riparian vegetation in the graded area and minimally in the adjacent areas. Through implementation of Mitigation Measure Bio-2 (Vegetation Communities) above, Red Alder/Riparian Woodland, impacts will be reduced to a level less than significant.
- c) Because the primary purpose of the project is to restore stream channels and reduce the potential for delivery of sediment into wetlands, the project will have a less than significant impact on federally protected wetlands. The US Army Corps has been consulted on this project and have preliminarily determined that no permit will be necessary. A formal letter from the Corps will be obtained.
- e) The project has a component that is considered "major vegetation" under Section 20.308.080 of the Coastal Element. Trees growing in the sediment behind the culverts will be removed during the excavation. Implementation of Bio-2 (Vegetation Communities) above will reduce the impacts to a level that is less than significant.
- f) This project does not conflict with any Habitat Conservation Plans, Natural Communities Conservation Plans, or other approved habitat conservation plan. No impact.

V. CULTURAL RESOURCES.

ENVIRONMENTAL SETTING

The park lands vary from sea level to nearly 800 feet in elevation and are for the most part heavily forested with second or third growth redwood, conifers, and hardwoods. Resources attractive to both prehistoric and historic people abound in the park, but sites suitable for occupation are limited by the steep terrain to river terraces and ridges or benches near springs.

The most important plants harvested by indigenous peoples in ethnographic times include oak, hazel, and seaweeds. Various animals of known importance to native peoples would have been present in the local area in pre-contact times. They include invertebrates from the littoral zone, sea mammals, fish, Roosevelt elk, black-tailed deer, and smaller game such as rabbits and birds.

Logging and limited homesteading took place in the park during historic times and are the primary activities that have resulted in the creation of historic resources in the park. Remains of water transportation systems that controlled the delivery of saw logs to the mill on the flat at the west end of the park are evident along the river corridor and lumber camps were present along that corridor though built evidence may no longer exist. An extensive railroad system was also developed and several railroad grades and bridge pilings have been recorded in the park. Three homesteads existed and others may well be present. A mill was in fairly continuous use from the mid-1850s until 1938 when it was acquired by the Union Lumber Company and the complex was razed. After that date an extensive network of roads were established and saw logs were trucked to Fort Bragg.

	<u>POTENTIALLY SIGNIFICANT IMPACT</u>	<u>LESS THAN SIGNIFICANT WITH MITIGATION</u>	<u>LESS THAN SIGNIFICANT IMPACT</u>	<u>NO IMPACT</u>
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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource, pursuant to §15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

DISCUSSION

a) Areas of potential cultural sensitivity have been identified through historical maps and site surveying. Implementation of Mitigation Measure Cult-1 below will reduce potential impacts to a less than significant level.

MITIGATION MEASURE CULT-1

1. Construction activities will be restricted in those areas where deposits might be encountered. Prior to construction, protection zones will be established by a DPR-qualified archaeologist with suitable buffers to prevent encroachment. Flagging or orange plastic fencing will remain in place during construction and will be removed when the project is complete.
2. An archaeological monitor will be present during all ground disturbing activities in areas that are potentially culturally sensitive.
3. In the event that previously unknown cultural resources are encountered during project construction by any person involved in that work, the state representative will immediately halt construction at that specific location and redirect workers to other areas until a DPR-qualified archaeologist has assessed the find and implemented any necessary avoidance, preservation, and recovery measures. Workers will be advised that cultural resources may be indicated by the discovery of shellfish remains, bone, chipping debris from production of stone tools, ground stone tools such as mortars and pestles, beads, human remains, and historic artifacts and features.
4. In the event that human remains are discovered, work will cease immediately in the area of the find and the project manager/site supervisor will notify the appropriate DPR personnel. Any human remains and/or funerary objects will be left in place. The DPR Sector Superintendent (or authorized representative) will notify the County Coroner, in accordance with §7050.5 of the California Health and Safety Code, and the Native American Heritage Commission (NAHC) will be notified within 24 hours of the discovery if the Coroner determines that the remains are Native American. The NAHC will designate the “Most Likely Descendent” (MLD) of the deceased Native American. The MLD will recommend an appropriate disposition of the remains. If a Native American monitor is on-site at the time of the discovery and that person has been designated the MLD by the NAHC, the monitor will make the recommendation of the appropriate disposition.

b,c) Sensitive areas associated with known cultural sites will be avoided during construction activities and an archaeological monitor will be present during all ground disruption in sensitive areas.

Mitigation Measure Cult-1 above will be implemented to reduce the potential impacts to a less than significant level.

VI. GEOLOGY AND SOILS.

ENVIRONMENTAL SETTING

REGIONAL GEOLOGY¹

The Big River unit of Mendocino Headlands State Park lies on the western (coastal) side of the Mendocino Range, the westernmost range of the California Coast Range Geomorphic Province, a northwest-trending range of mountains that forms the central and northern California coastline. This portion of the California coast lies along the active boundary between the Pacific and North American tectonic plates. In general, the Pacific Plate is moving northward at a greater rate than the North American plate's northwestward movement, resulting in both a strike-slip component as well as one of convergence along the plates' common boundary.

Prior to the development of the San Andreas Fault system, the margin along the interface of these two tectonic plates was characterized by a mixing of seafloor sediments and pieces of the plates as the Pacific Plate was subducted under the North American plate. These various deposits were accreted onto the North American plate, folded, faulted, and uplifted, and today are represented in the rocks of the Coast Range Province known as the Franciscan Province. Uplift of the Coast Range continues today at an estimated rate of about 0.3 mm a year.

The interaction between uplift and sea level changes has resulted, along the Mendocino Coast, in a series of "marine terraces" comprising wave-cut bedrock benches mantled with deposits of sand and gravel. Long-term equilibria between the rate of tectonic uplift and ocean level rise during interglacial periods resulted in long periods during which wave action eroded sedimentary deposits to form the broad benches now characteristic of these marine terraces.

The bedrock of the Big River watershed, in the Coastal Belt of the Franciscan Complex, is estimated to be 40 to 60 million years old, some of the younger rocks within the complex. Graywacke sandstone and shale are the primary constituents, with lesser amounts of conglomerate, chert, limestone, and volcanics. Within the Big River unit, the Coastal Belt rocks are overlain with marine, estuarine, and riverine deposits, beach and older dune sands, and landslide deposits.

TOPOGRAPHY

From west to east, the topography within the Big River watershed varies from uplifted marine terraces sloping gently seaward, to more mountainous and stream-dissected ridges and upland valleys. While the highest peak within the watershed is over 2800 feet above sea level, within the Big River unit elevations range from sea level along the estuary to about 1000 feet (305 meters) at Mathison Peak.

SLOPE STABILITY

The physical properties of the base rocks and regional tectonics, along with slope pitch, relief, and discontinuities in the substrates, play essential roles in slope stability and the rate of mass wasting in the Big River unit. These factors contribute to a higher proportion of debris slides along the steep streamside slopes along Big River and to deeper seated landslides in the eastern highland parts of the unit. Tectonic uplift resulting in stream down-cutting and the

formation of inner gorges contributes to the rate of small landslides along secondary water courses.

BIG RIVER CHANNEL

The river gradient through the unit is about 0.0475%, categorized as either a “C” channel (Rosgen 1994) or a “regime” channel (Montgomery and Buffington 1993). Tidal and estuarine influences mask most fluvial processes along the estuary, which represents a “drowned” river mouth due to sea-level rise during the Holocene epoch. An estimated 100 feet of sediment has accumulated at the river mouth over the past 9000 years, an average of about 3 mm of sediment a year in the estuary.

Alluvial sediment along the river has created a flat-floored valley; most of the river’s banks are formed within this alluvium, while some are eroded into steep valley wall slopes of colluvium or bedrock. The width of this valley ranges from about 275 to over 1400 feet; the banks are generally composed of unconsolidated, uncemented silt and sand, resulting in frequent slumping and sloughing into the river channel. A major factor in the existing channel geomorphology was the construction of “splash dams” and attendant channel side-clearing of vegetation early in the watershed’s logging history; these activities intensified flooding along the river and may have resulted in a wider channel along some reaches, especially in the lower watershed. More recently, the river channel has narrowed, possibly a result of the cessation of “splash damming” and log transport on the river, and the restoration of more natural fluvial processes.

(For further information on the geology and geomorphology of the Big River unit, please refer to the following: Engineering Geologic Resource Assessment, Big River State Park. 2004. California Geological Survey [Mark G. Smelser, Wayne D. Haydon, and Stephen D. Reynolds, chief investigators].)

SOILS

The following information on the more common soil types within the project area is derived from the U. S. Department of Agriculture, Natural Resources Conservation Service website: <http://www.ca.nrcs.usda.gov/mlra02/wmendo.html>. Please refer to this site for further information on the precise locations of these soil types within the Big River unit.

DEHAVEN-HOTEL COMPLEX, 50-75% SLOPES

This map unit is on hills. The vegetation is mainly redwood and Douglas-fir. Elevation ranges from 10 to 800 feet. The average annual precipitation is 40 to 70 inches, the average annual air temperature is about 53 degrees F, and the average frost-free period is 290 to 365 days.

This unit is about 45 percent Dehaven gravelly loam and 35 percent Hotel very gravelly loam. The Dehaven and Hotel soils occur as areas so intricately intermingled that it was not practical to map them separately at the scale used.

Included with these soils in mapping are small areas of Tramway and Irmulco soils and small areas of shallow soils. Also included are small areas of soils that have been altered by skid trails, landings, and roads and small areas that have slopes of 30 to 50 percent or 75 to 99 percent. Included areas make up about 20 percent of the total acreage of the unit. The percentage varies from one area to another.

The Dehaven soil is deep to bedrock and is well drained. It formed in material derived from sandstone. Typically, the surface is covered with a mat of leaves and twigs about 2 inches thick. The surface layer is brown and pale brown gravelly loam about 17 inches thick. The upper 17 inches of the subsoil is brownish yellow very gravelly sandy clay loam. The lower 18 inches is brownish yellow extremely gravelly sandy clay loam. Hard, fractured sandstone is a depth of about 52 inches.

Permeability is moderate in the Dehaven soil. Available water capacity is low. The effective rooting depth is limited by bedrock at a depth of 40 to 60 inches. Surface runoff is very rapid, and the hazard of water erosion is very severe if the surface is left bare.

The Hotel soil is moderately deep to bedrock and is well drained. It formed in material derived from sandstone. Typically, the surface is covered with a mat of leaves and twigs about 2 inches thick. The surface layer is brown very gravelly loam about 8 inches thick. The subsoil is light yellowish brown and very pale brown very gravelly clay loam about 27 inches thick. Hard, fractured sandstone is at a depth of about 35 inches. In some areas the surface layer is gravelly loam.

Permeability is moderate in the Hotel soil. Available water capacity is low. The effective rooting depth is limited by bedrock at a depth of 20 to 40 inches. Surface runoff is very rapid, and the hazard of water erosion is very severe if the surface is left bare.

The main limitations affecting the harvesting of timber are the slope and the hazard of erosion. When timber is harvested, the slope limits the use of wheeled and tracked equipment in skidding operations. Cable yarding systems generally cause less disturbance of the soil. Revegetation of exposed subsoil is difficult on this unit; however, it generally is not needed for control of surface erosion because of the large amount of coarse fragments. Roads may fail and landslides may occur following deep soil disturbance in the steeper areas. Rock for construction of roads generally is available in areas of this unit. Rocks and loose soil material may slide onto roads. This hazard increases the need for road maintenance.

Plant competition is a concern affecting the production of timber. When openings are made in the canopy, invading brushy plants that are not controlled can delay the establishment of seedlings. Reforestation can be accomplished by planting redwood and Douglas-fir seedlings. Natural reforestation by redwood sprouts and Douglas-fir seed trees provides variable stocking results. Both overstocked and understocked areas are common. Movement of loose surface material can reduce seedling survival rates in the steeper areas.

BIGRIVER LOAMY SAND, 0 TO 5 PERCENT SLOPES

This very deep, well drained soil is found on flood plains, formed in alluvium derived from sandstone. The vegetation is mainly redwood. Elevations range from 10 to 125 feet. The average annual precipitation is 45 to 65 inches, the average annual air temperature is about 53 degrees F, and the average frost-free period is 290 to 365 days.

Typically, the surface layer is variegated pale brown and very pale brown loamy sand about 6 inches thick. The underlying material to a depth of 63 inches or more is variegated brown, yellowish brown, pale brown, very pale brown, light yellowish brown, and grayish brown, stratified loamy sand, sandy loam, and loam. In some areas the surface layer is sandy loam.

Included with this soil in mapping are small areas of Cottoneva soils and areas of Riverwash. These included areas make up about 20 percent of the total acreage of the unit. The percentage varies from one area to another.

Permeability is moderately rapid in the Bigriver soil. Available water capacity is moderate. The effective rooting depth is more than 60 inches. Surface runoff is slow, and the hazard of water erosion is slight if the surface is left bare. This soil is frequently flooded for brief periods from December through April.

This unit is used mainly for timber production or wildlife habitat. A few areas are used for recreation.

Redwood is the main tree species on this soil. On the basis of a 100-year site curve, the mean site index for redwood is 188. The potential annual production from a fully stocked stand of redwood is 2,050 board feet per acre. Trees of limited extent include red alder.

The main limitation affecting the harvesting of timber is the seasonal wetness. Ponding limits the use of equipment to dry periods. Unsurfaced roads and skid trails are soft when wet. They may be impassable during rainy periods. Suitable surfacing of roads is needed for use during wet seasons. Rock for construction of roads generally is not available in areas of this unit.

TROPAQUEPTS, 0 TO 15 PERCENT SLOPES

These very deep, very poorly drained soils are on marine terraces at the heads of drainageways, along drainageways, or in shallow depressions. They formed in marine sediments. In some areas the vegetation is mainly dense stands of Mendocino cypress and Labrador tea. In other areas it is mainly perennial grasses, sedges, and waxmyrtle. Elevation ranges from sea level to 600 feet. The average annual precipitation is 40 to 65 inches, the average annual air temperature is about 53 degrees F, and the average frost-free period is 250 to 365 days.

A representative profile has a surface layer of dark gray clay loam about 7 inches thick. The upper 17 inches of the subsoil is light gray clay that has brownish yellow mottles. The lower 5 inches is gray sandy clay loam. The substratum to a depth of 63 inches or more is light brownish gray, light gray, and pale yellow loamy sand and sand.

Included with these soils in mapping are small areas of Aborigine, Blacklock, Shinglemill, and Tregoning soils. These included soils make up about 20 percent of the total acreage of the unit. The percentage varies from one area to another.

Permeability and available water capacity are extremely variable in the Tropaquepts. The effective rooting depth is limited by continuous saturation from December through April. The saturated zone starts between the surface and a depth of 10 inches and extends to a depth of more than 60 inches. Water may be ponded on the surface for brief or long periods following episodes of heavy rain. Surface runoff ranges from ponded to medium, and the hazard of water erosion is slight or moderate if the surface is left bare.

WOULD THE PROJECT:	<u>POTENTIALLY SIGNIFICANT IMPACT</u>	<u>LESS THAN SIGNIFICANT WITH MITIGATION</u>	<u>LESS THAN SIGNIFICANT IMPACT</u>	<u>NO IMPACT</u>
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"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input checked="" type="checkbox"/>
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1997), 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 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"/>
f) 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"/>

DISCUSSION

- a) This project does not involve the construction or maintenance of any structure intended for long-term human shelter, and no known active earthquake faults or seismically active areas exist within project areas. The risk of injury or death resulting from liquefaction, slides, or other soil movements will not be increased as a result of project activities. The restroom building will be situated outside any known seismically active areas, and the slope above the placement site does not exhibit any historical indications of mass wasting. Soil moved into project sites will be stabilized through the practice of techniques described in the project description and appendices, and soil grades will not be overburdened such that mass wasting could result. This project will remove unstable fill and road prism material that could eventually fail, thereby enhancing surface stability. Therefore, the net

effect of this project will be to reduce the risk of catastrophic failures of soil within project areas. No impact.

- b) The prevention of local soil loss, erosion, and sedimentation of adjacent stream channels are primary concerns of this project. The intention of the project is to reduce the risks of erosion within the selected project sites. However, during and after remedial efforts, some soil surfaces will remain exposed to precipitation, wind, and other factors that could destabilize the soil surface and result in erosion. While overburdened fill slopes and road prisms will be removed, thereby reducing long-term risk of catastrophic slope failure, new, barren slopes will result from the remedial activities. These will, however, be graded at no greater than a 2:1 ratio (horizontal to vertical), greatly reducing potential for massive erosion. Soil on all slopes and newly graded surfaces will be mechanically compacted to increase short-term stability. Measures designed to provide stability and protective cover to barren soil surfaces have been designed into during- and post-construction treatments of all project areas. The project will result in a less than significant impact resulting from soil loss. Mitigation measures are described below (Mitigation Geo-1).
- c) This project is specifically designed to reduce the potential for on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse, through the removal of overburdened fill slopes and road fill prisms. Some project components will actively address sites where mass wasting and significant erosion have been problems. The quarry site, where fill from other project sites will be introduced, is a geologically stable basin; the soil introduced to this site will be subjected to compaction and grading to create a stable soil surface, after which the site will be appropriately contoured to facilitate surface sheet flow and treated with erosion control materials and revegetation to reduce the incidence of erosion. No impact.
- d) The installation site for the restroom building, the only structure proposed for construction as part of this project, will not occur on expansive soil. No impact.
- e) Septic systems or waste water disposal are not included in this project. No impact.
- f) No known paleontological resources exist within any of the project sites. No impact.

MITIGATION MEASURE GEO-1

- Work at all sites will be restricted to dry weather. No work will occur if there is a 30% forecasted chance of rain within 48 hours. With the onset of the rainy season, project work will be stopped until surface conditions are dry and the potential for surface movement of water and sediment is substantially reduced. All project work sites in which work has not been completed will be “winterized” with the application of erosion control materials, covering of loose debris piles, and installation of debris fences, as necessary.
- During remedial work, in all sites where exposed soil could move or shift due to precipitation, project activities, or otherwise, materials such as straw wattles or erosion control fabric will be installed to eliminate erosion potential.
- State Parks will institute and sustain a monitoring and maintenance program to avoid on- or off-site movement of soil or other surface materials. Deteriorated erosion control materials will be replaced, as necessary, to continue to reduce

erosion potential until vegetation has increased to 90% cover in project work areas.

- All work sites, as part of ongoing monitoring and maintenance, will be evaluated for the need to introduce native plant cover from either seed or nursery stock. If native plant cover is less than 50% after three years, native species will be planted or seeded onto the sites.
- State Parks will adopt best management practices and use materials, methods, and techniques to implement erosion and sedimentation control, and to otherwise stabilize slopes and barren soil surfaces, as described in Appendix C, Standard Specifications & Best Management Practices for Disturbed Lands Remediation.

VII. HAZARDS AND HAZARDOUS MATERIALS.

ENVIRONMENTAL SETTING

There are no known hazardous materials within the plan area. No fuel storage facilities exist within or adjacent to the project area. Park employees will transport diesel to sites where heavy equipment is operating. No airports are located within two miles of the project site.

Physical hazards in the Big River unit are similar to any outdoor setting and include steep slopes, rushing water, poisonous plants, wild animals, disease-carrying insects, and inclement weather. The project area is in approximately 10 miles to the nearest hospital – about 15 minutes by vehicle. At some of the remote areas within the project area, transportation to the highway is via unpaved roads and may increase transportation time to a hospital by 30-45 minutes. No airstrips exist within the park or adjacent to park property. A helicopter landing location can be utilized at the parking area and entrance to the park.

	<u>POTENTIALLY SIGNIFICANT IMPACT</u>	<u>LESS THAN SIGNIFICANT WITH MITIGATION</u>	<u>LESS THAN SIGNIFICANT IMPACT</u>	<u>NO IMPACT</u>
WOULD THE PROJECT:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and/or accident conditions involving the release of hazardous materials, substances, or waste into the environment?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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 type="checkbox"/>	<input checked="" type="checkbox"/>
d) Be located on a site which is included on a list of hazardous materials sites, compiled pursuant to Government Code §65962.5, and, as a result, create a significant hazard to the public or environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Be 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? If so, 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) Be located in the vicinity of a private airstrip? If so, 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 type="checkbox"/>	<input checked="" type="checkbox"/>
h) Expose people or structures to a significant risk of loss, injury, or death from wildland fires, including areas where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

DISCUSSION

- a) The proposed plan does not involve the disposal of hazardous materials. However, the plan does involve the routine transportation of small amounts of diesel fuel to the work site. Construction activities will require the use of certain potentially hazardous materials, such as fuels, oils, and solvents. These materials are generally used for excavation equipment, generators, and other construction equipment and will be contained in vessels engineered for safe storage. Large quantities of these materials will not be stored at the construction site. Spills, upsets, or other construction-related accidents could result in a release of fuel or other hazardous substances into the environment. The mitigations indicated in Mitigation Measure HAZMAT-1 below will reduce the potential for adverse impacts from these incidents to a less than significant level.

MITIGATION MEASURE HAZMAT-1

- Equipment will be cleaned and repaired (other than emergency repairs) outside the park boundaries. All contaminated water, sludge, spill residue, or other hazardous compounds will be disposed of outside park boundaries, at a lawfully permitted or authorized location.
- No maintenance or fueling activities will be allowed within 200 feet of a stream.
- All equipment will be inspected for leaks immediately prior to the start of construction, and regularly inspected thereafter until equipment is removed from park premises. Leaks that develop will be repaired immediately in the field or work with that equipment will be suspended until repairs could be made.
- The contractor(s) will prepare an emergency spill response plan prior to the start of construction. DPR will ensure that the contractor maintains a spill kit on-site throughout the life of the project, or provides multiple sets of cleanup materials to each crew, if sharing will prevent timely implementation of cleanup plans. In the event of any spill or release of any chemical in any physical form on or immediately adjacent to the project sites or within the Big River unit during construction, the contractor will immediately notify the appropriate DPR staff (e.g., project manager or supervisor). Appropriate agencies will be notified in the event of significant spillage.

- b) Failure of, or leakage from, vehicles or heavy equipment could result in the release of hazardous substances (primarily petroleum based products) to the ground or water. Mitigation Measure Hazmat-1 above will reduce the potential for adverse impacts to a less than significant level. Discarded barrels may be discovered in the work area and may containing unknown potentially hazardous substances. Implementation of the following mitigation measure, in conjunction with Hazmat-1 above, will reduce any potential impacts related to these finds to a less than significant level.

MITIGATION MEASURE HAZMAT-2

- If there is evidence of spillage from or free product discovered on or adjacent to the project sites, work will be halted or diverted from the immediate vicinity of the find and the DPR Sector's hazardous materials coordinator will be contacted. Hazardous materials, if present, will be contained and removed from the site prior to resumption of work. Removal of all contaminants, including sludge, spill residue, or containers, will be conducted following established DPR procedures and in compliance with all applicable local, state, and federal regulations and guidelines regarding the handling and disposal of hazardous materials.
- Abandoned vehicles located within the project sites will be removed and disposed of under the supervision of the hazardous materials coordinator.

- c) The plan area is not located within one-quarter mile of any school and no schools are proposed for this area. No impact.
- d) The road treatment sites in the Big River unit are not included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5. Therefore, no impact will occur with project development.
- e) The planned project sites are not located within two miles of a public use airport. Therefore, no impact will occur as a result of this plan.
- f) The planned project sites are not located within the vicinity of a private air strip. Therefore, no impact will occur as a result of this plan.
- g) A general safety protocol for backcountry heavy equipment operations has been adopted by the North Coast Redwoods District, California State Parks (Merrill 2003) for use within state parks and will be implemented as part of this project. This protocol outlines broad safety issues common to all projects and presents guidelines on how to address those issues. The project will not impact emergency response or evacuation plans..
- h) Heavy equipment can get very hot during the warmer part of the work season and is sometimes in close proximity to flammable vegetation. Improperly outfitted exhaust systems or friction between metal parts crushing rocks could generate sparks. The safety plan developed for each project is reviewed by all project staff and includes job site characteristics to reduce the potential for fire. The following mitigations will reduce the potential for adverse impacts from these incidents to a less than significant level.

MITIGATION AND CONDITION MEASURES HAZMAT-3

- A fire safety plan will be in place prior to the start of any construction, including availability of identified fire suppression equipment and any required employee training.
- Spark arrestors or turbo-charging (which eliminates sparks in exhaust) and fire extinguishers will be required for all heavy equipment.
- Construction crews will be required to park vehicles away from flammable material such as dry grass and brush. At the end of each workday, heavy equipment will be parked over mineral soil to reduce the chance of fire. All equipment will be required to be mechanically sound and free of flammable debris.
- Park staff will be required to have a State Park radio on site, which allows direct contact to California Department of Forestry and Fire Protection and centralized dispatch center, to facilitate the rapid dispatch of control crews and equipment in case of a fire.

VIII. HYDROLOGY AND WATER QUALITY.

ENVIRONMENTAL SETTING

Information in this section is chiefly derived from “Sediment Source Analysis for the Big River Watershed, Mendocino County, CA,” prepared by Graham Matthews and Associates (GMA 2001).

WATERSHED CONDITIONS

The Big River watershed covers 115,886 acres (181.05 mi²) in coastal and central Mendocino County. The watershed lies within a Mediterranean-type climate zone, with mean annual precipitation for the entire watershed about 55 inches (140 cm). Elevations within the watershed range from sea level to about 2836 feet (864 m) atop Irene Peak, a few miles southwest of Willits.

For the purposes of planning, the entire watershed has been subdivided into 5 planning watersheds, and 18 sub-watersheds. The Big River unit of Mendocino Headlands State Park is situated entirely within the Lower Big River planning watershed, and occupies significant portions of the following four sub-watersheds: Big River Estuary, Lower Big River, Laguna Creek, and Little North Fork. Watershed hydrology is primarily influenced by rainfall events that are, in general, most intensive from November through April. However surface and subterranean hydrology is also significantly affected by topography, geology, soils, vegetation, ecological processes, and disturbances expressed over time, as well as by human activities (e.g., management regimes) and artifacts.

Big River has been listed as a “sediment impaired waterbody” in California’s 1995 Clean Water Act, Section 303(d) list, as adopted by the North Coast Regional Water Quality Control Board (RWQCB), resulting in the river’s non-attainment of designated beneficial uses, such as salmonid habitat. The RWQCB is responsible for enforcing provisions of the federal and state Clean Water Acts and other water quality laws and regulations. Among RWQCB responsibilities are the designation of total maximum daily load standards and achievement of sediment reduction yields on north coast rivers, including Big River. DPR assumes, in its role as a public land manager, responsibility for assisting in the achievement of water quality goals along the lower reaches of the Big River and its tributaries.

The recent history of the watershed is closely related to the 150-year history of logging and its effects, including dam construction, log transport on the river, road-building, and timber harvest. The juxtaposition of steep slopes, precipitation, road construction and other land uses, and vegetative cover have been influential in the current conditions that characterize the stream crossings and roads within the Lower Big River watershed. Road density in the Big River unit is about 8 linear miles per square mile, the greatest road density in the watershed. As a broad conclusion, Graham Matthews and Associates (2001) correlated road construction and timber harvest-related disturbance with sediment production from slides, watershed-wide.

Surface erosion associated with road surfaces is also a primary source of stream-borne sediments within the watershed, and the position of roads on slopes also influences the occurrences of fluvial and mass wasting processes (GMA 2001). Stream-crossing and ditch-relief culverts also pose management problems, as poorly situated or undersized culverts often become blocked with debris or otherwise fail to channel surface water flow in established

streambeds, resulting in gullying and rilling of road surfaces, road fill failures, and deposit of substantial amounts of sediment into stream channels. The California Geological Survey (2004) has indicated that roads and watercourse crossings have the greatest potential for erosion and sediment delivery to tributaries and to Big River.

Currently, State Parks has no surface water quality monitoring program in place for the Big River unit. The establishment of baseline measurements of appropriate water quality parameters would be advantageous in assessing the fulfillment of project goals.

WATER QUALITY

Water quality in the Big River unit ranges from good and relatively pollutant- and sediment-free, in streams that drain less disturbed and more intact forest stands, to turbid, very poor quality in streams draining slopes that are more disturbed, whether through natural or human-caused conditions. Precipitation in the park occurs primarily in the six months from November through April, and the turbidity and sediment content of Big River and its major tributaries generally increase during the rainy season.

Groundwater in the park is relatively free of pollutants and considered very high quality because very few potential pollution sources exist. The groundwater table in the park fluctuates annually, depending on rainfall and seasonal temperatures, and is also influenced spatially by geology and topography. The Big River watershed is not a recharge area for commercially available aquifers, and no public water sources in the area will be affected by this project.

	<u>POTENTIALLY SIGNIFICANT IMPACT</u>	<u>LESS THAN SIGNIFICANT WITH MITIGATION</u>	<u>LESS THAN SIGNIFICANT IMPACT</u>	<u>NO IMPACT</u>
WOULD THE PROJECT:				
a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input 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 that 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 alteration of the course of a stream or river, in a manner which would result in substantial on- or off-site erosion or siltation?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Substantially alter the existing drainage pattern of the site or area, including through 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 on- or off-site flooding?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" 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) Substantially degrade water quality? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 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 structures that would impede or redirect flood flows within a 100-year flood hazard area? | <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 from flooding, including flooding resulting from the failure of a levee or dam? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| j) Result in inundation by seiche, tsunami, or mudflow? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

DISCUSSION

- a) As noted in Section VI. Geology and Soils, this project is likely to increase the short-term potential for erosion within active project areas, thus increasing the potential for the introduction of increased levels of sediment to tributaries and Big River. Along stream channels, vegetation and soil removal, grading, and contouring will result in barren slopes during and following project implementation. While the long-term goals of this project include the improvement of slope stability, a decrease in erosion potential, and improvement of surface water quality, the short-term effects of project-related soil disturbance could be significantly negative with regard to erosion and sedimentation of streams. Mitigations described below will reduce this impact to a less than significant level.
- b) This project is not designed to have any influence on groundwater supplies or quality. The project only addresses real and potential sources of sediment, as a function of surface water flow, for remediation, with no alterations of the availability of groundwater planned. No impact.
- c) This project is very unlikely to have the dramatic effect of altering larger scale or local drainage patterns. However, alterations will be made to short reaches along several tributaries of Big River, through the removal of culverts, road prism fill, and overburdened fill slopes along roads, the re-establishment of historical streambank morphology and stream courses, the outsloping of roads, and the armoring of stream crossings along roads. The intention of this project is to decrease the erosive or mass wasting potential of existing conditions that have resulted in unstable and failed slopes, blocked culverts, and erosion. The remedial work described will, nonetheless, increase the short-term potential for erosion within project restoration areas, and these changed conditions could result in short-term increases in sedimentation downstream. Mitigation measures described below will reduce the impact to a less than significant level.
- d) The scale of this project, along with its emphasis for remedial work along tributaries of Big River, will not result in any change in the potential for downstream flooding. Runoff rates of surface water will not be altered, but as noted, a primary goal is the reduction in the

sediment load accompanying water runoff. Thus, the project, even at a small scale, intends to reduce the local potential for flooding of roads or other surfaces as a result of blockages by stream-borne debris and sediment. No impact.

- e) This project is not involved in changing or altering any stormwater runoff management system, and also does not involve any introduction or disturbance of known sources of pollutants. No impact
- f) Water quality within the Big River watershed, as measured by any of several parameters, has already been negatively influenced by the past land management history of the watershed. While surface water quality could be reduced, short-term, by this project, as a result of erosion from project work sites, the long-term goal is to reduce sources of sediment along tributary streams that flow into Big River. Through the implementation of the design features outlined above, water quality will be improved within the affected tributaries. However, failure to implement the described measures, which address high-priority sites of potential erosion and sedimentation, could result in an undetermined negative contribution to surface water quality in tributaries as well as Big River. Implementation of the described measures will reduce the potential for impact to a less than significant level.
- g) No housing is planned for construction as part of this project. No impact.
- h) The pre-fabricated restroom building proposed for placement in the entry-parking lot area of the Big River unit will be situated outside the 100-year flood plain, as mapped by the California Geological Survey in 2005 and delineated on the official Flood Insurance Rate Map prepared by the Federal Emergency Management Agency (FEMA) in 1983. No impact.
- i) No levees or dams will be constructed as part of this project, and no levees or dams lie within any of the proposed project work areas, or downstream where any project-related activities could result in a failure of such structures. No impact.
- j) This project will not alter the background risk of inundation from a seiche, tsunami, or mudflow. The proposals to re-surface entry-area parking lots and place boulders to delimit these lots are the only project activities planned within the 100-year floodplain and within potential range of inundation that could result from these natural phenomena. No impact.

MITIGATION MEASURE HYDROLOGY AND WATER QUALITY-1
<ul style="list-style-type: none">▪ California State Parks will adopt all measures necessary to comply with applicable existing laws and regulations governing water quality. State Parks will comply with applicable recommendations from the North Coast Regional Water Quality Control Board, and the California Department of Fish and Game for the implementation of measures to reduce erosion and sedimentation to acceptable levels, and to develop water-quality monitoring standards for the purposes of assessing the results of this project. To this end, State Parks will, as necessary, develop a monitoring program that includes the measures of pertinent parameters for water quality both prior to

and following the completion of this project.

- State Parks will adopt best management practices and use materials, methods, and techniques to implement erosion and sedimentation control and to otherwise stabilize slopes and barren soil surfaces, as described in Appendix C, Standard Specifications & Best Management Practices for Disturbed Lands Remediation.
- As determined is necessary, State Parks will develop site-specific revegetation plans to augment the previously implemented best management practices and measures for control of erosion and sedimentation.

IX. LAND USE AND PLANNING.

ENVIRONMENTAL SETTING

The proposed plan is located within the boundaries of the Big River unit, which is unclassified at this time. The intended purpose of Park land is to preserve outstanding natural, scenic, and cultural values, and indigenous aquatic and terrestrial fauna and flora. No General Management Plan exists currently for the unit, but DPR’s Departmental Operations Manual, Section 0300 defines the goals and objectives of restoration of natural resources. The unit, at the time of the transfer of land, was zoned as Forest Land, Timber Production in Mendocino County. The Mendocino County General Plan (adopted in 1981) designates the property as Forest Lands. However the County is currently conducting a comprehensive update of its General Plan, which will include the Big River unit. In addition to resource preservation, the park is used for public recreation. The project sites are located in areas that are undeveloped.

The Big River unit connects large tracts of undeveloped land across the landscape. It provides a north-south corridor of openspace by sharing boundaries with Jackson Demonstration State Forest and Mendocino Woodlands State Park. The southern boundary of the Big River unit is in close proximity to Van Damme State Park, and several sections of the Big River unit boundary are adjacent to large tracts of timber land.

Portions of the project are within the California Zone, designated by the California Coastal Commission. The primary mission of the Commission, as the lead agency responsible for carrying out California’s federally approved coastal management program, is to plan for and regulate land and water uses in the coastal zone consistent with the policies of the Coastal Act. Mendocino County is responsible for permitting development activities within the Coastal Zone as set forth in their Local Coastal Program.

	<u>POTENTIALLY SIGNIFICANT IMPACT</u>	<u>LESS THAN SIGNIFICANT WITH MITIGATION</u>	<u>LESS THAN SIGNIFICANT IMPACT</u>	<u>NO IMPACT</u>
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 the applicable land use plan, policy, or regulation of any agency with jurisdiction over the project (including, but not limited to, a 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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input 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"/>

DISCUSSION

- a) The plan will not physically divide an established community because no community exists within the plan boundary. No impact.
- b) Chapter 20.496 of the Mendocino County General Plan, Coastal Element outlines the criteria for environmentally sensitive habitat areas (ESHA’s). Because most of these

proposed restoration projects occur within stream channels, they inherently occur within ESHA's. Additionally, the project has a component that is considered "major vegetation" under Section 20.308.080 of the Coastal Element. Trees growing in the sediment behind the culverts will be removed during the excavation.

The project is consistent with Mendocino County General Plan Sec. 20.496.025 regarding wetlands and riparian vegetation in that the activities of the project are limited to restoration.

Although DPR has not adopted a General Plan for this property, the property has not been classified by the California Parks and Recreation Commission, and therefore the project is consistent with Public Resources Code Section 5002.2. Moreover, the project is the repair and rehabilitation of an existing facility (landscape).

Although the primary purpose of the project is to reduce the potential delivery of sediment to streams and to restore the natural hydrologic processes of watercourse, measures will be taken to ensure the restoration is successful. Mitigation Measure BIO-2 (Vegetation Communities) will be implemented to reduce the potential impacts to watercourses, riparian vegetation, and sensitive species to a level that is less than significant.

- c) The plan will not conflict with any applicable habitat conservation plan or natural community conservation plan because no such plans have been adopted. No impact.

X. MINERAL RESOURCES.

ENVIRONMENTAL SETTING

The primary mineral resources in Mendocino County are sand and gravel. Several abandoned rock quarries exist on the Big River property, but no other significant mineral resources have been identified in the project area. The most recently utilized quarry in the Big River unit was first opened in the 1950s to provide materials for a nearby Caltrans project, and was used until the acquisition of the land by State Parks. However, the quarry is no longer in use and is being restored under a Reclamation Plan overseen by the California Department of Conservation Office of Mine Reclamation, the County of Mendocino, and the California Department of Parks and Recreation.

Mineral extraction is not allowed under Department of Parks and Recreation management directives, and therefore rock and gravel mining will not occur in the Big River unit.

	<u>POTENTIALLY SIGNIFICANT IMPACT</u>	<u>LESS THAN SIGNIFICANT WITH MITIGATION</u>	<u>LESS THAN SIGNIFICANT IMPACT</u>	<u>NO IMPACT</u>
WOULD THE PROJECT:				
a) Result in the loss of availability of a known mineral resource that is or 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"/>

DISCUSSION

- a) Implementation of this project will not result in the loss of availability of a mineral resource of current or potential statewide or regional importance, because none is known to exist in the project area. No impact.
- b) The project will not result in the loss of a locally important or potentially important mineral resource, as none is known to exist in the project area. No mineral resource delineated in a local general, specific or other land use plan will be made unavailable. No impact.

XI. NOISE.

ENVIRONMENTAL SETTING

The western end of the Big River unit of Mendocino Headlands State Park is located adjacent to the Pacific Ocean and the town of Mendocino. Highway 1 serves as the westernmost boundary. Noise levels in the park unit are greatest at the western end due to highway use and concentrated recreational use at the beach. Comptche-Ukiah Road on the southern boundary and rural residential development to the north and south also create noise that exceeds ambient forest background levels. Periodic timber management activities, including tree falling, east of the park unit, also contribute to higher noise levels. The interior of the unit is relatively quiet and serene. Existing noise affecting the project area results from administrative use on park roads and occasional air traffic consisting of small private planes, Coast Guard helicopters, CDF firefighting aircraft, and illegal motorcycle activity. This park contains special status animal species that can be adversely affected by excessive noise during their nesting and breeding seasons. The USFWS has developed guidelines for eliminating noise impacts to threatened and endangered wildlife species in this area. These guidelines include seasonal restrictions on the use of heavy equipment in potential habitat and/or during periods of nesting or the early phase of rearing of young. These restrictions apply to any use of heavy equipment throughout the region. The USFWS has provided technical assistance to State Parks projects regarding noise impacts prior to construction implementation.

	<u>POTENTIALLY SIGNIFICANT IMPACT</u>	<u>LESS THAN SIGNIFICANT WITH MITIGATION</u>	<u>LESS THAN SIGNIFICANT IMPACT</u>	<u>NO IMPACT</u>
WOULD THE PROJECT:				
a) Generate or expose people to noise levels in excess of standards established in a local general plan or noise ordinance, or in other applicable local, state, or federal standards?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Generate or expose people to excessive groundborne vibrations or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Create a substantial permanent increase in ambient noise levels in the vicinity of the project (above levels without the project)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Create a substantial temporary or periodic increase in ambient noise levels in the vicinity of the project, in excess of noise levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Be 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? If so, 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"/>
f) Be in the vicinity of a private airstrip? If so, 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"/>

DISCUSSION

a) Construction noise levels at and near the planned project areas will fluctuate, depending on the type and number of pieces of construction equipment operating at any given time. There are no noise-sensitive human land uses located in the vicinity of the plan site that will be substantially affected by the proposed construction-related activities and no known noise standards applicable to this area (other than species-related noise restrictions for project constraints related to endangered and threatened species). However, depending on the specific construction activities being performed, short-term increases in ambient noise levels could result in speech interference near the project site. Implementation of the following mitigations, in conjunction with BIO-3, will reduce the any potential adverse impacts to a less than significant level.

MITIGATION MEASURE NOISE-1

- | |
|---|
| <ul style="list-style-type: none"> • Construction activities will generally be limited to the hours between 6 a.m. and 6 p.m. • Internal combustion engines used for any purpose at the job site will be equipped with a muffler of a type recommended by the manufacturer. Equipment and trucks used for construction will utilize the best available noise control techniques (e.g., engine enclosures, acoustically attenuating shields or shrouds, intake silencers, ducts, etc.) whenever feasible and necessary. • Stationary noise sources and staging areas will be located as far from private dwellings and open public use areas (sensitive receptors) as possible. If they must be located near these sensitive receptors, stationary noise sources will be muffled to the extent feasible and/or, where practicable, enclosed within temporary sheds. |
|---|

b) The plan will not generate or expose people to excessive groundborne vibrations or groundborne noise levels because only a few relatively small pieces of heavy equipment will be operating at any one time. The sizes of the machines used will not generate excessive vibrations. No impact.

c) Project-related noise will only occur during actual construction. Once construction is completed, all noise-generating equipment will be removed from the site. The plan will not create any source that will contribute to a substantial permanent increase in ambient noise levels in the vicinity of the project. No impact.

d) See Discussion XI(a) above. No more than ten pieces of heavy equipment will be operating on this project at any one time throughout the park. The project sites will be closed to the public during construction and only construction workers will be affected by the equipment noise. Because the sites are primarily in thick second growth forests, noise travels only a short distance before it becomes muffled by vegetation and wind. The work sites are well away from campgrounds and visitor use areas. Because the equipment usually moves about 300 to 1000 feet per day, noise impacts will be transitory. Less than significant impact.

e,f) The plan is not within an airport land use plan and is not within two miles of an airport or private air strip; therefore, the project will have no impact.

XII. POPULATION AND HOUSING

ENVIRONMENTAL SETTING

No housing exists within the plan area and no housing development is planned. The entire plan area is owned by State Parks. State Park staff generally lives in coastal Mendocino County. Occasionally, contract workers may camp on-site during the construction phase in travel trailers. The trailers are required to be self-contained and are located on existing roads, landings, or other areas used by seasonal work crews.

	<u>POTENTIALLY SIGNIFICANT IMPACT</u>	<u>LESS THAN SIGNIFICANT WITH MITIGATION</u>	<u>LESS THAN SIGNIFICANT IMPACT</u>	<u>NO IMPACT</u>
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 type="checkbox"/>	<input checked="" 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"/>

DISCUSSION

a,b,c) The plan will not induce substantial population growth because the plan does not involve housing or new businesses. The plan will be removing abandoned forest roads that are not used by the general public and will have no direct or indirect effect on population growth. The project will have no more than 15 people working at one time during the summer and fall months. No replacement housing for employees will be required, because all workers already maintain housing in the region or provide their own temporary facilities. No people will be displaced because the plan only involves removal of abandoned logging roads that have no access or use by residences. All work will take place within the confines of the park boundaries, with no additions or changes to the existing local infrastructure, except for one additional restroom. Therefore, the plan will have no impact on population growth or housing requirements in the area.

XIII. PUBLIC SERVICES.

ENVIRONMENTAL SETTING

The Big River unit of Mendocino Headlands State Park is located near the town of Mendocino. State Park Rangers provide the primary law enforcement role in the Park. The area is generally rural, with fire and emergency services provided by the California Department of Forestry and Fire Protection (CDF), Mendocino Volunteer Fire Department, and the US Coast Guard.

	<u>POTENTIALLY SIGNIFICANT IMPACT</u>	<u>LESS THAN SIGNIFICANT WITH MITIGATION</u>	<u>LESS THAN SIGNIFICANT IMPACT</u>	<u>NO IMPACT</u>
WOULD THE PROJECT:				
a) Result in significant environmental impacts from construction associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:				
Fire protection?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Police protection?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input 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 type="checkbox"/>	<input checked="" type="checkbox"/>
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

DISCUSSION

a) The areas of road proposed for work are, in many areas, severely damaged, impassible by vehicles, or at immediate risk of becoming impassible. Failed stream crossings and slope failures have previously limited access beyond damaged road segments. Completing these projects will enhance the ability of both law enforcement and fire protection to safely access more areas of the park for patrol, and in case of fire or other emergency. To further facilitate fire response, the Mendocino District of State Parks is currently collaborating with CDF to complete a Wildfire Management Plan for its Big River property. Implementation of Mitigation Measure Hazmat Condition-2 will reduce impact on fire protection to a less than significant level. None of the project elements are expected to contribute to a significant increase in visitation, or the need for an increase in the level of public services. There are no existing or proposed schools within one-quarter mile of the proposed project sites.

XIV. RECREATION.

ENVIRONMENTAL SETTING

The Big River unit of Mendocino Headlands State Parks covers almost 7400 acres of forests, wetlands, and riparian habitat. The unit, acquired by State Parks in 2002, has no camping provisions, yet is a popular destination for various “light” recreational uses (e.g., walking, bicycling), open to the public daily from sunrise to sunset. Under the Terms and Conditions of the property transfer agreement for the Big River “... DPR intends to use and manage the Property for the purposes of estuarine, wetlands, aquatic, and wildlife habitat preservation, restoration and management, wildlife-oriented education and research, and for compatible public park uses consistent with estuarine, wetlands, aquatic, fish and wildlife habitat preservation and restoration...” The pertinent passage, relevant to use of the park unit for recreation, is that such uses are to be consistent with “habitat preservation and restoration.”

Big River is a slow-moving stream during the dry season (May – October), with a low gradient through the park unit. The estuary (subjected to tidal influences) extends inland from the river mouth by about 6 miles. The estuary outlet is a popular recreational area, with surfing, kayaking, canoeing, and swimming among aquatic activities, and the adjacent beach is also a local recreational haven. Light watercraft recreation is common along the estuary, and less frequently the lower reaches of the river. Few, if any, of the tributary streams support conditions amenable to small watercraft access. Fishing does not appear to be a primary recreational interest; commercial crabbing has been practiced in the estuary in the recent past.

As a legacy of its logging history, the park features a relatively high density of gravel- or soil-surfaced roads and spurs, about 8 linear miles of roads per square mile. These roads, especially Road M1, the main haul road, are favored by local bicyclists, equestrians, runners, and walkers. The roads in the Big River unit provide connections to county roads, Mendocino Woodlands State Park, and Jackson Demonstration State Forest. All roads within the park unit are closed to public motor vehicle access (open only for State Parks business, law enforcement, fire protection, or other types of official and emergency access). Park roads are thus not used as a through access for motor vehicles to reach other destinations. The haul road, M1, is the only access road for bicyclists, equestrians, and emergency vehicles to the greater portion of the park unit north of Big River.

The greater portion of the off-road area of the park unit is either upland forest or wetlands; slopes are typically quite steep (>50%), and significant amounts of large, woody debris on the forest slope make passage, even on foot, difficult. Although off-road areas are not impassable, anecdotal evidence suggests that few park visitors venture more than several meters off-road in most locations. Foot travel through salt marshes and other wetlands and along riparian corridors is also challenging and apparently forbidding to most park visitors. In general, public off-road travel is not advised due to management and public safety concerns.

	<u>POTENTIALLY SIGNIFICANT IMPACT</u>	<u>LESS THAN SIGNIFICANT WITH MITIGATION</u>	<u>LESS THAN SIGNIFICANT IMPACT</u>	<u>NO IMPACT</u>
WOULD THE PROJECT:				
a) Increase the use of existing neighborhood and regional parks or other recreational facilities, such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

DISCUSSION

- a) The proposed stream and road restoration work is not anticipated to have any effect on the uses of other recreational facilities in the local or county-wide area. However, the project will require short-term closures of Road M1 during restoration work at stream crossings and fill-slope failure sites. Because of the volume of material to be removed from some sites and the rugged terrain surrounding these sites, the designation of bypass or detour routes for walkers, runners, bicyclists, or equestrians is unlikely to be feasible. In some cases, local road closure could extend to several days to a week or more. State Parks will provide public notification in the media and through park postings prior to and during all restoration activities that result in road closures. New stream crossings along M1 and other roads will be designed to sustain use by all aforementioned recreational users following the completion of site-specific projects. No impact.
- b) No recreational facilities will be constructed or developed as part of this project. No impact.

XV. TRANSPORTATION/TRAFFIC.

ENVIRONMENTAL SETTING

Most of the sites proposed for rehabilitation are on the main road (M1 and M14) bisecting the park and paralleling the Big River. Since the property has been in State Park ownership, and some time before, the eastern portion of the main road has not been used as a vehicle thoroughfare. Several years ago a massive slope failure occurred on a portion of M14, leaving the road narrowly passable by a bicycle.

Many of the restoration sites address culverts that were undersized when they were originally placed in the watercourse. The purpose of restoring and repairing these watercourse crossings is to prevent further failure of the roads and prevent sediment loads from entering watercourses.

	<u>POTENTIALLY SIGNIFICANT IMPACT</u>	<u>LESS THAN SIGNIFICANT WITH MITIGATION</u>	<u>LESS THAN SIGNIFICANT IMPACT</u>	<u>NO IMPACT</u>
WOULD THE PROJECT:				
a) Cause a substantial increase in traffic, in relation to existing traffic and the capacity of the street system (i.e., a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Exceed, individually or cumulatively, the level of service standards established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Cause 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) Contain a design feature (e.g., sharp curves or a dangerous intersection) or incompatible uses (e.g., farm equipment) that would substantially increase hazards?	<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 type="checkbox"/>	<input checked="" type="checkbox"/>
f) Result in inadequate parking capacity?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

DISCUSSION

- a) The plan will not increase the traffic on any public street system. No impact.
- b) The plan will not cause traffic levels to exceed, individually or cumulatively, the level of service standards for designated roads or highways; the number of vehicles and frequency of travel related to this plan is insignificant. No impact.

- c) The plan sites are not located within an airport land use plan, within two miles of a public airport, or in the vicinity of a private air strip, and do not serve as a normal reporting point for air traffic in the area. Nothing in the proposed plan will in any way affect or change existing air traffic patterns; therefore, no impact will occur as a result of this plan.
- d) The plan does not contain a design feature or incompatible uses that will substantially increase traffic hazards. Roads proposed for removal have been in private ownership and have not been open to the public. During operations of the project, public access above and below the restoration sites will be closed by a State Park Superintendent's Order.
- e) During construction of watercourse crossings vehicle access across the excavated crossings may be temporarily restricted. Because vehicles will be parked on the side of the crossing closest to the parking lot, emergency access will not change. No impact.
- f) The plan will not result in inadequate parking capacity because it does not propose a change in parking area, but a resurfacing of an existing facility. The construction workers on this project will park service vehicles close to the work site and move the vehicle down the road a few hundred feet every couple of hours as work progresses. No impact.
- g) The plan will not conflict with adopted policies, plans, or programs supporting alternative transportation because it does not reduce or increase transportation uses. No impact.

XVI. UTILITIES AND SERVICE SYSTEMS.

ENVIRONMENTAL SETTING

Located near the town of Mendocino, most of the Big River unit of Mendocino Headlands State Park was recently industrial timberland. No utilities are available in the park. There are no camping areas and therefore camping-related services are not provided. Day-use garbage cans are emptied by State Parks personnel, and the refuse deposited in dumpsters at the Russian Gulch Headquarters. Currently, portable self-contained chemical toilets are provided for public use. A semi-permanent, self-contained vault style toilet is proposed

	<u>POTENTIALLY SIGNIFICANT IMPACT</u>	<u>LESS THAN SIGNIFICANT WITH MITIGATION</u>	<u>LESS THAN SIGNIFICANT IMPACT</u>	<u>NO IMPACT</u>
WOULD THE PROJECT:				
a) Exceed wastewater treatment restrictions or standards 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Would the construction of these facilities cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Would the construction of these facilities cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" 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 that serves or may serve the project, that it has adequate capacity to service the project's anticipated 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 as they relate to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

DISCUSSION

a,b) No wastewater will be produced by these projects. No impact.

c) No construction of new storm water drainage facilities or expansion of existing facilities will be required or will result from these projects. No impact.

d) No outside water source will be needed during project work. No impact.

e,f,g) No wastewater will be generated by these projects. Solid waste resulting from the restroom will be pumped by an appropriate service authorized for such activities. No impact.

CHAPTER 4

MANDATORY FINDINGS OF SIGNIFICANCE

	<u>POTENTIALLY SIGNIFICANT IMPACT</u>	<u>LESS THAN SIGNIFICANT WITH MITIGATION</u>	<u>LESS THAN SIGNIFICANT IMPACT</u>	<u>NO IMPACT</u>
WOULD THE PROJECT:				
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, reduce the number or restrict the range of a rare or endangered plant or animal?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Have the potential to eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means the incremental effects of a project are considerable when viewed in connection with the effects of past projects, other current projects, and probably future projects?)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Have environmental effects that will cause substantial adverse effects on humans, either directly or indirectly?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

DISCUSSION

- a) The California Department of Parks and Recreation has evaluated the proposed project and its impacts on the environment, fish and wildlife, plants, animals and plant communities, and rare or endangered plants and animals. While the project has the potential to degrade the environment, most project activities have been designed to avoid potentially significant impacts to the physical or biotic environment. In addition, for potentially significant impacts for which avoidance is infeasible in order to accomplish project objectives, mitigation measures have been incorporated into the project design. Full implementation of these measures will eliminate or reduce impacts to a less-than-significant level. The overall goals of this project, as well as the individual site-specific goals and objectives, have been designed and will be implemented to result in a net benefit to the environment.
- b) The California Department of Parks and Recreation has evaluated the proposed project for its potential impacts on historical, cultural, and archaeological impacts. Because of the extent of excavations and soil-surface disruptions associated with this project, a full assessment of all project sites was not accomplished. However, as a result of the evaluations of project sites as performed, several mitigation measures have been incorporated into the project design, including avoidance of sensitive surface features, on-site archaeological monitoring during soil-disturbing project activities, and training for workers and stoppage-of-work requirements for any incidents of discovery of potentially

significant archaeological or cultural resources; these measures are to be applied in project activity areas where soil excavations are proposed. Implementation and fulfillment of these mitigation measures will render project impacts on previously undocumented cultural resources less than significant.

- c) No other projects are planned for any of the proposed sites for this project within the foreseeable future. All sites will be regularly re-visited for up to 5 years following project implementation for the purposes of monitoring, maintenance, structural repairs to erosion control measures and materials, and revegetation. These activities themselves constitute the effective mitigations for any negative impacts that might accrue from this project. The cumulative impacts of the collective components of this project are designed to be to the benefit of the general condition of the Big River unit, its roads, streams, forest, and wildlife habitats. Any negative impacts are expected to be less than significant, short-lived, and isolated during and immediately following project implementation and State Parks will respond to these impacts as they are detected, through regular monitoring and maintenance of restoration sites.

Other restoration projects may be planned in the future for the same general purposes as those proposed here, including road recontouring, culvert and fill-slope removals, stream restorations, road decommissioning, and conversions of roads to trails. Road maintenance and repairs constitute, typically, smaller scale projects that will be ongoing each year, generally during the dry season (April – October). Maintenance projects include repair and maintenance of stream crossing and ditch-relief culverts, clearing of roadside ditches, clean-up of slope failures (rockslides, etc.), and removal of invasive non-native plants. These activities are not anticipated to generate significant impacts to the environment individually or cumulatively.

- d) Most project activities will have no potentially significant effects on humans. However, environmental impacts on air quality (e.g., heavy equipment emissions), geology (e.g., slope failures), ambient noise levels (e.g., heavy equipment operation), or hydrology (e.g., slope liquefaction), or those that could be caused by the use of hazardous materials (e.g., heavy equipment fuels), could have substantially adverse effects on humans. While this project could have substantially adverse, direct or indirect effects on humans, implementation of this project according to designed safety standards, engineering specifications, park closure and warning notices and other prescribed safety precautions, project monitoring, and mitigation measures will reduce these potential impacts to a less-than-significant level.

CHAPTER 5

SUMMARY OF MITIGATION MEASURES AND CONDITIONS

The following mitigation measures and conditions would be implemented by DPR as part of the Big River Watershed Restoration Project.

MITIGATION AND CONDITION MEASURES AIR-1

- All equipment engines will be maintained in good condition, in proper tune (according to manufacturer’s specifications), and in compliance with all State and federal requirements.
- All equipment engines will be maintained in good condition, in proper tune (according to manufacturer’s specifications), and in compliance with all State and federal requirements.
- Traffic speed on unpaved roads will be limited to 15 miles per hour (mph).
- Excavation and grading activities will be suspended when sustained winds exceed 25 mph, instantaneous gusts exceed 35 mph, or when dust from construction might obscure driver visibility on public roads.
- No more than ten pieces of heavy equipment will operate at the sites at the same time. No more than ten service vehicles will enter the project site at one time.
- Soils will be maintained at a moisture level that will not generate dust. Soil wetting shall be conducted in a manner that does not generate any surface runoff into watercourses. Water drafting will be conducted in accordance with the National Marine Fisheries Service, 2001 Water Drafting Guidelines.

MITIGATION AND AVOIDANCE MEASURES – BIO-1 (PLANTS)

***Carex lyngbyei* – Lyngbye's Sedge**

- The location of Lyngbye’s sedge occurs at the outer edge of one project site. It is not within the proposed grading area and the soil will not be disturbed. To avoid disturbances, such as brush piling, the stand will be flagged for avoidance.

***Mitella caulescens*– Leafy-Stemmed Mitrewort**

- Two project sites contain this species. A mitigation plan (Appendix G) for transplantation is proposed for these areas of stream channel restoration. Execution of the mitigation plan is expected to reduce project-related impacts to a less-than-significant level.

MITIGATION MEASURE – BIO-2 (VEGETATION COMMUNITIES)

Red Alder Riparian Woodland

- Site restoration will begin with all measures necessary to control erosion and sedimentation as specified in “Standard Specifications & Best Management Practices for Disturbed Lands Remediation” (California Geological Survey 2005). Implementation of these measures will start during all construction and ground-disturbing activities at each site, and will be sustained until soil stability and 90% vegetational cover has been re-established, as determined by field observations during post-project monitoring.

- Primary on-site erosion-control methods will include one or more of the following
 - The installation of organic erosion control materials (weed-free rice straw, weed-free rice straw wattles, jute) or synthetic materials, such as landscape fabric
 - slash bundles, willow wattles, or other on-site vegetative material anchored on slopes, within stream corridors, along road edges, etc., to effect a reduction in movement of soil into streams or otherwise off-site
- Prior to the start of restoration at all sites, vegetation, ground cover, and physical data will be collected by State Parks natural resources staff to establish baselines for an array of environmental parameters. Data collection will be both quantitative (transects, plots, or relevé assessments) and qualitative (photographic).
- Erosion control and sediment reduction measures will remain in place for the duration of the site monitoring and maintenance period for each site; removal of devices or materials used for these purposes will be dependent upon the achievement of goals and objectives for slope stability, streambed characteristics, water quality, and vegetational composition and cover.
- Removal of invasive, non-native plants by any of the following:
 - Manual removal (preferred)
 - Mechanical removal
 - Manual treatments (e.g., tarping)
 - Herbicide treatments (e.g. Glyphosate)
- Revegetation of disturbed areas (either exposed soil or vegetation dominated by invasive, non-native plants) with native plant species, either from seed collected and sown on-site, or from nursery-propagated native plant material.
- Monitoring and site maintenance of both erosion control materials and non-native plant species will continue until a site has achieved a minimum native plant cover of 50% and surface runoff does not carry sediment from the site, and as determined by State Parks natural resources staff, regulatory agencies' staff, or professional scientists contracted for the purposes of assessing restoration goals.

Northern Coastal Salt Marsh, Coastal Brackish Marsh

- The restoration activity will take place outside of the rainy season. However, to ensure no sediment is transported off site and into the salt marsh and river, silt fencing will be placed downstream of the work area. Any accumulated sediment will be removed and transported off site.

MITIGATION MEASURES BIO-3 (MAMMALS)

Red Tree Vole

- Prior to operations, the project inspector (PI) or park staff shall be instructed by State Park biologists in the identification of red tree voles and red tree vole nests. Trained Park staff or PI will inspect project areas before construction is to begin, and will monitor each site during construction. Any red tree vole nests encountered at the work site will be flagged and avoided during construction, to the extent practicable.

Ringtail, Humboldt Marten, Pacific Fisher

- Prior to operations, the PI or park staff shall be instructed by State Park biologists in the identification of ringtail, marten, and fisher and their dens. Trained Park staff or PI will inspect project areas before construction is to begin, and will monitor each site during construction. Any ringtail, marten, or Pacific fisher dens encountered at the work site will be flagged and, to the extent practicable, avoided during construction.

MITIGATION MEASURES BIO-4 (BIRDS)

Northern Spotted Owl

- Absence of northern spotted owl (NSO) surveys – if NSO surveys are not conducted then the following conditions shall apply.
 - No trees 12” dbh or greater shall be removed.
 - No operations shall occur from February 1 through August 31. Depending on the proposed action, the August 31 date may be modified to July 10 through a request for Technical Assistance from the US Fish and Wildlife Service (USFWS).
- If trees 12” dbh or greater are to be removed then the following shall apply.
 - No operations shall occur unless a valid NSO Technical Assistance has been obtained from USFWS. The results of the Technical Assistance may result in modification of the standard protection measures stipulated under Item C below.
 - Surveys for the NSO will be conducted in conformance with accepted USFWS approved NSO survey protocols. A map showing the locations (if any) of known NSO activity centers during the past 3 years will be obtained. An activity center is defined as a site identified through protocol-level surveys with the presence of nesting, pair status, or resident single status as defined in the NSO protocol (USFWS 1992). The final determination of an activity center will be made by the USFWS.
 - If any known activity center occurs within 1,000 feet of the proposed action then the following standard protection measures shall apply (these measures may be subsequently changed through technical assistance with the USFWS).
 - a. A buffer zone for NSO shall be established within a 1,000 foot radius of a tree or trees containing a nest or supporting an activity center.
 - b. At no time shall operations occur within a 500 foot radius of an activity center. Within the 500 foot to 1,000 foot spatial buffer, the minimum habitat requirements of functional roosting habitat (minimum 60% canopy, average stand trees >11” dbh) shall be maintained.
 - c. A ¼ mile temporal buffer shall be established around any active activity center during the NSOs critical period which occurs from February 1 through August 31. During the critical period no operations shall occur within the temporal buffer.

Generic Falconiformes

- Pursuant to Fish and Game Code §3503.5, it is unlawful to take, possess, or destroy any birds in the order Falconiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any other regulation adopted pursuant hereto. Therefore prior to operations, the project inspector (PI) or park staff will be instructed in the identification of raptor nests (both occupied and unoccupied) and raptor breeding behavior. During operations the inspector

will be responsible for assuring that no raptor nests are impacted by the proposed treatments by implementing the following measures:

- If an unoccupied raptor nest is detected (during the generic critical period of January 15 through August 31), the nest tree and surrounding screen trees will not be disturbed and the location will immediately be reported to the Senior Environmental Scientist.
- If an unoccupied raptor nest is detected outside of the generic critical period then operations will cease in the vicinity of the nest and its location will be reported immediately to the Senior Environmental Scientist. The Senior Environmental Scientist or designee will then attempt to determine the species of raptor that constructed or used the nest and then the measures stated below under Item C will be applied (based on the species).
- If an occupied raptor nest is detected in the project area, then the PI will cease operations within ¼ mile of the raptor nest (unless it is known to be a peregrine falconerie, in which case a 1 mile buffer will be applied) and immediately notify the Senior Environmental Scientist. The Senior Environmental Scientist or designee will then determine the species of raptor and then the following measures will be applied (based on species).
-

Species	Critical Nesting Period	Temporal (disturbance) Buffer	Spatial (habitat) Buffer
Accipitridae			
Northern goshawk	March 1 – August 31	400 m (.25 mile)	50 m (165 feet)
Cooper’s Hawk	March 1 – August 31	400 m (.25 mile)	30 m (100 feet)
Sharp-shinned hawk	March 1 – August 31	400 m (.25 mile)	30 m (100 feet)
Pandionidae			
Osprey	February 15-August 31	400 m (.25 mile)	30 m (100 feet)
Falconidae			
American peregrine falcon	January 15-August 31	1.6 km (1 mile)	150 m (500 feet)

- DPR may consult with the California Department of Fish and Game on site-specific mitigation measures. Any such changes will be amended into the Mitigated Negative Declaration if necessary.

Generic cavity nesting birds

- Prior to operations, the project inspector (PI) or Park staff will be instructed in the identification of cavity nesting birds and their nests. Project areas will be surveyed by trained Park staff or the PI before construction is to begin. During construction, disturbed areas will be monitored for the presence of cavity-nesting birds and their nests. If an occupied nest is detected, the nest tree will be flagged and avoided during construction, to the extent practicable.

MITIGATION MEASURE – BIO-5 (AMPHIBIANS AND REPTILES)

- State Park biologists, or Park staff or project inspector (PI) trained by State Park biologists to identify potential habitat and trained in species identification, will survey project areas during summer months before and immediately before construction is to begin. During construction, disturbed areas will be monitored for the presence of amphibians and reptiles and any that are found will be relocated into adjacent undisturbed areas. At stream crossings where stream diversion is necessary, dewatered areas will be visually inspected for the presence of amphibians and reptiles, and any present will be captured and released upstream. Habitat consisting of seeps, springs, or inside ditches containing surface water will also be surveyed for amphibians and potential *Rhyacotriton variegates* habitat. Habitat will be flagged to minimize direct impacts.
- A 4-tier protocol (Welsh and Hodgson 1997) adapted to the project will be used at each site to potentially detect all possible species. A standardized protocol will allow for comparisons between future pre- and post-restoration and also comparisons between impacted and non-impacted channels in the lower Big River watershed. Primary modifications to this protocol involve reducing stream reaches from 900 ft. to 400 ft. (200 ft. upstream and downstream at each water crossing); 400 ft. is the maximum stream distance encompassing the Area of Potential Effect. Increasing the surveying distance would not be applicable to this project due to the topography, dense vegetation, and proximity to Big River, which would inhibit a potentially longer reach.
 - The 1st tier survey is a visual encounter survey (VES). This survey involves walking the survey reach and noting all amphibian and reptile sightings.
 - The 2nd tier survey is executed after a VES is completed. A map will be made depicting fast and slow aquatic habitats and 3 foot belts, 200 ft. above and below the road crossing. Two of the 66 belts will be randomly chosen in order to do area-constrained searches (ACS), one in fast aquatic habitats and one in slow aquatic habitats. If no fast water exists then only two slow water habitats will be surveyed. ACS requires a systematic search of the belt, removing substrate while using hand held nets for animal captures.
 - The 3rd tier, which is modified from Welsh and Hodgson (1996), will require one additional belt to be chosen in what appears to be high-quality habitat for aquatic amphibians. This will preferably be accomplished in a seep or spring entering the main channel or if non-existing, then within the main channel.
 - The 4th tier will begin immediately before construction and will be conducted on project sites with both channel and upland habitats. This survey involves a 30 minute upland search within the potential area of effect and a quick survey of the channel, preferably in habitats where animals were found (noting time spent searching). All animals found during the fourth tier and during construction will be relocated in suitable habitats.

MITIGATION MEASURE – BIO-6 (FISH)

- Stream crossing excavations do not occur on fish-bearing streams and they will take place in dry channels or in channels where stream flow is diverted around the excavation sites. Excavations have been designed to limit negative effects on water quality to the maximum extent practicable.
- In some crossings, where the stream is flowing at a slow rate and cannot be captured and diverted, filter structures will be installed downstream to filter turbid discharge from the work site. In other crossings, where flow is sufficient to be intercepted, a small diversion dam will be built upstream and stream flow piped around the worksite and discharged into the stream below the worksite.
- Streams and riparian zones will not be used as equipment staging or refueling areas. Equipment will be stored, serviced, and fueled away from streams and riparian areas. Heavy equipment will be cleaned (e.g., power washed, steamed) prior to being used below the ordinary high water mark.
- Post-construction erosion control has been incorporated into the plans for each project where road surfaces or slope areas will be disturbed. Disturbed areas adjacent to stream channels will be seeded with native plants under the direction of DPR and then erosion control blankets will be anchored on all disturbed slope areas. Alternatively, disturbed soil may be mulched with masticated native brush, trees, and/or slash generated during the clearing phase of the rehabilitation work. Disturbed road areas will be surfaced with angular gravel to a minimum thickness of 4 inches.
- DPR will ensure that contract(s) associated with the project contain all of the relevant BMPs (best management practices), and other descriptions of measures identified in this mitigated negative declaration and in other documents associated with consultations for this project as necessary to avoid or minimize incidental take of listed fish species

MITIGATION MEASURE BIO-7 (INVERTEBRATES)**Pomo bronze shoulderband**

Park staff or project inspector (PI) trained to identify potential habitat, and trained in species identification, will survey project areas immediately before construction is to begin, relocating any pomo bronze shoulderband snails discovered. During construction, disturbed areas will be monitored for the presence of the pomo bronze shoulderband snail. Any that are found will be relocated into adjacent, suitable, undisturbed areas.

MITIGATION MEASURE CULT-1

1. Construction activities will be restricted in those areas where deposits might be encountered. Prior to construction, protection zones will be established by a DPR-qualified archaeologist with suitable buffers to prevent encroachment. Flagging or orange plastic fencing will remain in place during construction and will be removed when the project is complete.
2. An archaeological monitor will be present during all ground disturbing activities in

areas that are potentially culturally sensitive.

3. In the event that previously unknown cultural resources are encountered during project construction by any person involved in that work, the state representative will immediately halt construction at that specific location and redirect workers to other areas until a DPR-qualified archaeologist has assessed the find and implemented any necessary avoidance, preservation, and recovery measures. Workers will be advised that cultural resources may be indicated by the discovery of shellfish remains, bone, chipping debris from production of stone tools, ground stone tools such as mortars and pestles, beads, human remains, and historic artifacts and features.
4. In the event that human remains are discovered, work will cease immediately in the area of the find and the project manager/site supervisor will notify the appropriate DPR personnel. Any human remains and/or funerary objects will be left in place. The DPR Sector Superintendent (or authorized representative) will notify the County Coroner, in accordance with §7050.5 of the California Health and Safety Code, and the Native American Heritage Commission (NAHC) will be notified within 24 hours of the discovery if the Coroner determines that the remains are Native American. The NAHC will designate the “Most Likely Descendent” (MLD) of the deceased Native American. The MLD will recommend an appropriate disposition of the remains. If a Native American monitor is on-site at the time of the discovery and that person has been designated the MLD by the NAHC, the monitor will make the recommendation of the appropriate disposition.

MITIGATION MEASURE GEO-1

- Work at all sites will be restricted to dry weather. No work will occur if there is a 30% forecasted chance of rain within 48 hours. With the onset of the rainy season, project work will be stopped until surface conditions are dry and the potential for surface movement of water and sediment is substantially reduced. All project work sites in which work has not been completed will be “winterized” with the application of erosion control materials, covering of loose debris piles, and installation of debris fences, as necessary.
- During remedial work, in all sites where exposed soil could move or shift due to precipitation, project activities, or otherwise, materials such as straw wattles or erosion control fabric will be installed to eliminate erosion potential.
- State Parks will institute and sustain a monitoring and maintenance program to avoid on- or off-site movement of soil or other surface materials. Deteriorated erosion control materials will be replaced, as necessary, to continue to reduce erosion potential until vegetation has increased to 90% cover in project work areas.
- All work sites, as part of ongoing monitoring and maintenance, will be evaluated for the need to introduce native plant cover from either seed or nursery stock. If native plant cover is less than 50% after three years, native species will be planted or seeded onto the sites.
- State Parks will adopt best management practices and use materials, methods, and techniques to implement erosion and sedimentation control, and to otherwise stabilize slopes and barren soil surfaces, as described in Appendix C, Standard Specifications & Best Management Practices for Disturbed Lands Remediation.

MITIGATION MEASURE HAZMAT-1

- Equipment will be cleaned and repaired (other than emergency repairs) outside the park boundaries. All contaminated water, sludge, spill residue, or other hazardous compounds will be disposed of outside park boundaries, at a lawfully permitted or authorized location.
- No maintenance or fueling activities will be allowed within 200 feet of a stream.
- All equipment will be inspected for leaks immediately prior to the start of construction, and regularly inspected thereafter until equipment is removed from park premises. Leaks that develop will be repaired immediately in the field or work with that equipment will be suspended until repairs could be made.
- The contractor(s) will prepare an emergency spill response plan prior to the start of construction. DPR will ensure that the contractor maintains a spill kit on-site throughout the life of the project, or provides multiple sets of cleanup materials to each crew, if sharing will prevent timely implementation of cleanup plans. In the event of any spill or release of any chemical in any physical form on or immediately adjacent to the project sites or within the Big River unit during construction, the contractor will immediately notify the appropriate DPR staff (e.g., project manager or supervisor). Appropriate agencies will be notified in the event of significant spillage.

MITIGATION MEASURE HAZMAT-2

- If there is evidence of spillage from or free product discovered on or adjacent to the project sites, work will be halted or diverted from the immediate vicinity of the find and the DPR Sector's hazardous materials coordinator will be contacted. Hazardous materials, if present, will be contained and removed from the site prior to resumption of work. Removal of all contaminants, including sludge, spill residue, or containers, will be conducted following established DPR procedures and in compliance with all applicable local, state, and federal regulations and guidelines regarding the handling and disposal of hazardous materials.
- Abandoned vehicles located within the project sites will be removed and disposed of under the supervision of the hazardous materials coordinator.

MITIGATION AND CONDITION MEASURES HAZMAT-3

- A fire safety plan will be in place prior to the start of any construction, including availability of identified fire suppression equipment and any required employee training.
- Spark arrestors or turbo-charging (which eliminates sparks in exhaust) and fire extinguishers will be required for all heavy equipment.
- Construction crews will be required to park vehicles away from flammable material such as dry grass and brush. At the end of each workday, heavy equipment will be parked over mineral soil to reduce the chance of fire. All equipment will be required to be mechanically sound and free of flammable debris.
- Park staff will be required to have a State Park radio on site, which allows direct contact to California Department of Forestry and Fire Protection and centralized dispatch center, to facilitate the rapid dispatch of control crews and equipment in case of a fire.

MITIGATION MEASURE HYDROLOGY AND WATER QUALITY-1

- California State Parks will adopt all measures necessary to comply with applicable existing laws and regulations governing water quality. State Parks will comply with applicable recommendations from the North Coast Regional Water Quality Control Board, and the California Department of Fish and Game for the implementation of measures to reduce erosion and sedimentation to acceptable levels, and to develop water-quality monitoring standards for the purposes of assessing the results of this project. To this end, State Parks will, as necessary, develop a monitoring program that includes the measures of pertinent parameters for water quality both prior to and following the completion of this project.
- State Parks will adopt best management practices and use materials, methods, and techniques to implement erosion and sedimentation control and to otherwise stabilize slopes and barren soil surfaces, as described in Appendix C, Standard Specifications & Best Management Practices for Disturbed Lands Remediation.
- As determined is necessary, State Parks will develop site-specific revegetation plans to augment the previously implemented best management practices and measures for control of erosion and sedimentation.

MITIGATION MEASURE NOISE-1

- Construction activities will generally be limited to the hours between 6 a.m. & 6 p.m.
- Internal combustion engines used for any purpose at the job site will be equipped with a muffler of a type recommended by the manufacturer. Equipment and trucks used for construction will utilize the best available noise control techniques (e.g., engine enclosures, acoustically attenuating shields or shrouds, intake silencers, ducts, etc.) whenever feasible and necessary.
- Stationary noise sources and staging areas will be located as far from private dwellings and open public use areas (sensitive receptors) as possible. If they must be located near these sensitive receptors, stationary noise sources will be muffled to the extent feasible and/or, where practicable, enclosed within temporary sheds.

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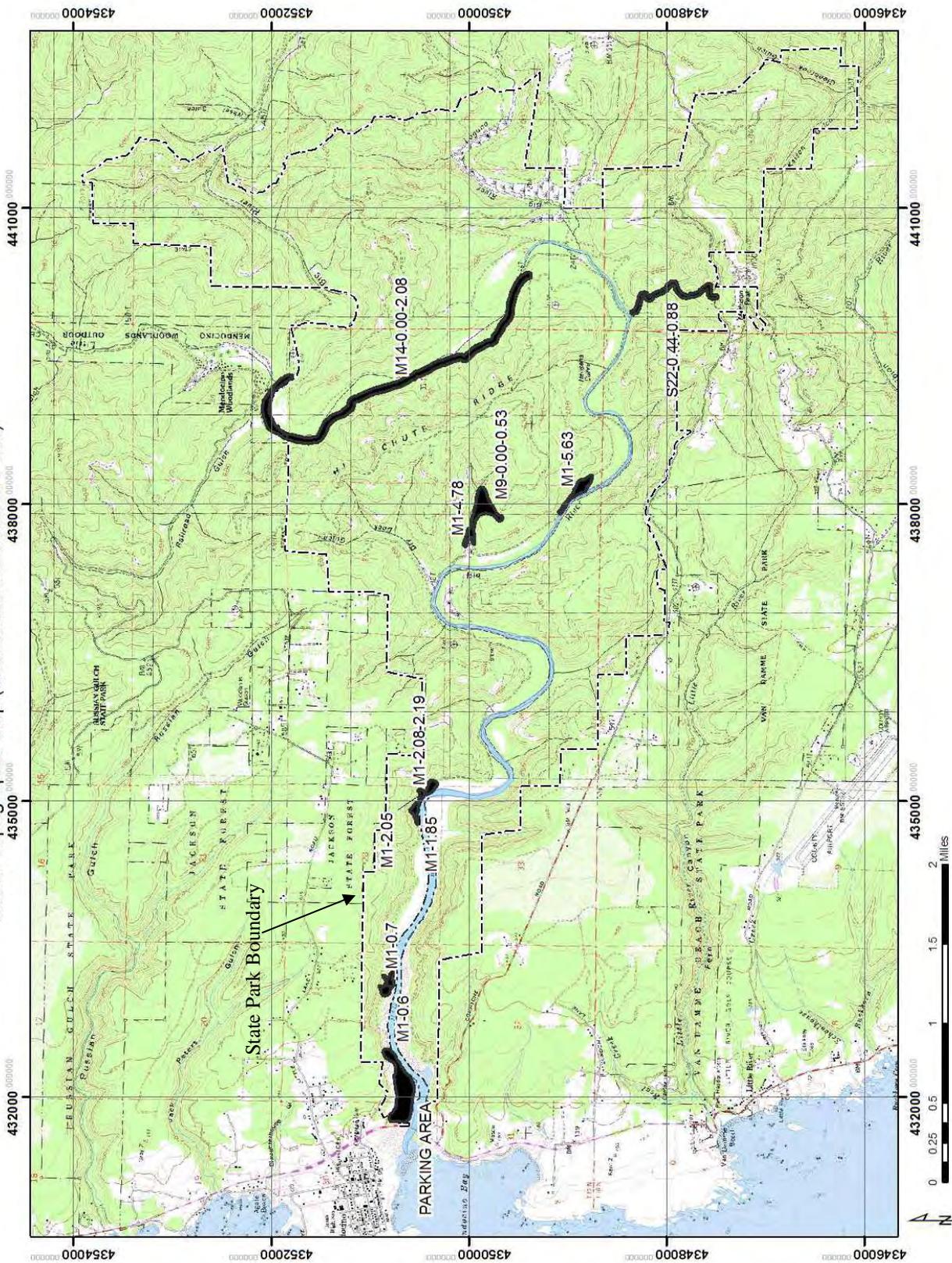
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APPENDIX A
MAPS, TABLES, AND CHARTS

APPENDIX A – MAP1 PROJECT LOCATION MAP

Big River Watershed Restoration Project
USGS Topographic Map (Mendocino & Mathison Peak)



APPENDIX A, Table 1

List of Plant Species observed within Project Area of Potential Effect, Big River unit Landscape Stabilization and Erosion Prevention Project

Vascular Plant List (* denotes non-native)

Phylum/ Family	Latin Binomial	Common Name	PARKING AREA	SITE M1-0.6	SITE M1-0.7	SITE M1-1.85	SITE M1-2.05	SITE M1-2.08- 2.19	SITE M1-4.78	SITE M1-5.63	SITE M9-0.00- 0.53	SITE M14-0.00- 2.08	SITE S22-0.44- 0.88
SPHENOPHYTA - Horsetails													
Equisetaceae - Horsetail Family													
	<i>Equisetum hyemale</i> ssp. <i>affine</i>	common scouring rush						X	X	X	X		X
	<i>Equisetum telmateia</i> ssp. <i>braunii</i>	giant horsetail		X	X	X	X		X	X	X	X	
PTEROPHYTA - Ferns and Allies													
Azollaceae - Water Fern Family													
	<i>Azolla filiculoides</i>	water fern											
Blechnaceae - Deer Fern Family													
	<i>Blechnum spicant</i>	deer fern				X	X						
	<i>Woodwardia fimbriata</i>	chain fern											
Dennstaedtiaceae - Bracken Family													
	<i>Pteridium aquilinum</i> var. <i>pubescens</i>	bracken		X		X	X		X	X	X	X	X
Dryopteridaceae - Wood Fern Family													
	<i>Athyrium filix-femina</i>	lady fern		X	X	X	X	X	X			X	X
	<i>Cystopteris fragilis</i>	fragile fern		X	X					X		X	
	<i>Dryopteris arguta</i>	wood fern		X	X	X	X			X		X	
	<i>Polystichum munitum</i>	sword fern	X	X	X	X	X	X	X	X	X	X	X
Polypodiaceae - Polypody Family													
	<i>Polypodium californicum</i>	California polypody											X
	<i>Polypodium glycyrrhiza</i>	licorice fern										X	
Pteridaceae - Brake Family													
	<i>Adiantum aleuticum</i>	five-finger fern		X	X	X	X		X	X		X	
	<i>Adiantum jordanii</i>	maidenhair fern										X	
	<i>Pellaea andromedifolia</i>	coffee fern											
	<i>Pentagramma triangularis</i>	goldback fern		X	X	X	X		X	X		X	X
Selaginellaceae - Selaginella Family													
	<i>Selaginella wallacei</i>	club-moss											
CONIFEROPHYTA - Conifers													
Cupressaceae - Cypress Family													
	<i>Cupressus goveniana</i> ssp. <i>pigmaea</i>	Mendocino cypress											
	<i>Cupressus macrocarpa</i> *	Monterey cypress											

Phylum/ Family	Latin Binomial	Common Name	PARKING AREA	SITE M1-0.6	SITE M1-0.7	SITE M1-1.85	SITE M1-2.05	SITE M1-2.08- 2.19	SITE M1-4.78	SITE M1-5.63	SITE M9-0.00- 0.53	SITE M14-0.00- 2.08	SITE S22-0.44- 0.88
Pinaceae - Pine Family													
	<i>Abies grandis</i>	grand fir	X	X	X			X		X	X	X	X
	<i>Picea sitchensis</i>	Sitka spruce											
	<i>Pinus contorta</i> ssp. <i>bolanderi</i>	Bolander pine											
	<i>Pinus contorta</i> ssp. <i>contorta</i>	shore pine											
	<i>Pinus muricata</i>	bishop pine	X					X					
	<i>Pinus radiata</i> *	Monterey pine											
	<i>Pseudotsuga menziesii</i>	Douglas-fir		X	X	X	X	X	X	X	X	X	X
	<i>Tsuga heterophylla</i>	western hemlock									X	X	X
Taxaceae - Yew Family													
	<i>Torreya californica</i>	California nutmeg				X				X		X	
Taxodiaceae - Bald-cypress Family													
	<i>Sequoia sempervirens</i>	coast redwood		X	X	X	X	X	X	X	X	X	X
ANTHOPHYTA - Flowering Plants													
Aceraceae - Maple Family													
	<i>Acer macrophyllum</i>												
Aizoaceae - Fig-marigold Family													
	<i>Carpobrotus chilensis</i> *	sea-fig; iceplant											
Anacardiaceae - Sumac Family													
	<i>Toxicodendron diversilobum</i>	poison-oak		X	X	X		X	X	X	X	X	X
Apiaceae (aka Umbelliferae) - Carrot/Parsley Family													
	<i>Angelica hendersonii</i>	angelica											
4	<i>Angelica lucida</i>	angelica											
	<i>Anthriscus caucalis</i> *	bur chervil											
	<i>Conioselinum pacificum</i>												
	<i>Conium maculatum</i> *	poison hemlock		X	X				X				
	<i>Daucus carota</i> *	Queen Anne's lace		X	X								
	<i>Daucus pusillus</i>	rattlesnake weed								X			
	<i>Foeniculum vulgare</i> *	fennel	X			X			X	X			
	<i>Heracleum lanatum</i>	cow parsnip											
	<i>Hydrocotyle ranunculoides</i>	hydrocotyle											
	<i>Ligusticum apiifolium</i>	lovage											
	<i>Oenanthe sarmentosa</i>	water parsley		X	X				X				
	<i>Osmorhiza chilensis</i>	sweet cicely		X	X	X		X		X	X	X	X
	<i>Sanicula crassicaulis</i>	snakeroot		X	X	X					X	X	X
	<i>Scandix pecten-veneris</i> *	Venus's needle											
	<i>Torilis arvensis</i> *	hedge parsley		X	X	X			X	X		X	X

Phylum/ Family	Latin Binomial	Common Name	PARKING AREA	SITE M1-0.6	SITE M1-0.7	SITE M1-1.85	SITE M1-2.05	SITE M1-2.08- 2.19	SITE M1-4.78	SITE M1-5.63	SITE M9-0.00- 0.53	SITE M14-0.00- 2.08	SITE S22-0.44- 0.88
Apocynaceae - Dogbane Family													
	<i>Vinca major*</i>	periwinkle											
Aquifoliaceae - Holly Family													
	<i>Ilex aquifolium*</i>	English holly											
Araliaceae - Ginseng Family													
	<i>Aralia californica</i>	elk clover							X	X		X	
	<i>Hedera helix*</i>	English ivy										X	
Aristolochiaceae - Birthwort Family													
	<i>Asarum caudatum</i>	wild ginger		X	X	X	X		X			X	
Asteraceae (aka Compositae) - Sunflower Family (64 taxa)													
	<i>Achillea millefolium</i>	yarrow											
	<i>Adenocaulon bicolor</i>	trail finder										X	X
	<i>Agoseris grandiflora</i>	California dandelion								X			
	<i>Ambrosia chamissonis</i>	beach bur	X										
	<i>Anaphalis margaritacea</i>	pearly everlasting		X	X		X			X	X		
	<i>Artemisia douglasiana</i>	western mugwort				X	X			X			
	<i>Aster chilensis</i>	California aster											
	<i>Baccharis douglasii</i>	marsh baccharis					X						
	<i>Baccharis pilularis</i>	coyote brush	X	X	X	X		X	X	X	X		X
	<i>Bellis perennis*</i>	lawn daisy		X	X								X
	<i>Bidens cernua</i>												
	<i>Bidens frondosa</i>	sticktight											
	<i>Carduus pycnocephalus*</i>	Italian thistle	X	X	X				X	X	X		
	<i>Centaurea melitensis*</i>	Napa starthistle; tochalote		X	X								
	<i>Chamomilla suaveolens*</i>	pineapple weed											
	<i>Chrysanthemum segetum*</i>	corn chrysanthemum		X	X								
	<i>Cirsium arvense*</i>	Canada thistle							X	X			
	<i>Cirsium brevistylum</i>	Indian thistle										X	
	<i>Cirsium vulgare*</i>	bull thistle		X	X	X	X	X		X	X	X	X
	<i>Conyza canadensis</i>	horseweed		X	X	X	X		X	X		X	
	<i>Conyza floribunda*</i>									X			
	<i>Cotula coronopifolia*</i>	brass buttons		X	X								
	<i>Crepis capillaris*</i>	hawkbeard											
	<i>Erechtites glomerata*</i>	Australian fireweed		X	X	X	X		X	X			X
	<i>Erechtites minima*</i>	Australian fireweed		X	X	X	X					X	
	<i>Erigeron karvinskianus*</i>	fleabane											
	<i>Erigeron foliosus</i>	fleabane								X			
	<i>Eriophyllum lanatum</i>	woolly sunflower								X		X	
	<i>Filago gallica*</i>	herba impia											
	<i>Gnaphalium collinum*</i>	cudweed				X				X		X	X
	<i>Gnaphalium luteo-</i>	cudweed								X			

Phylum/ Family	Latin Binomial	Common Name	PARKING AREA	SITE M1-0-6	SITE M1-0-7	SITE M1-1-85	SITE M1-2-05	SITE M1-2-08- 2.19	SITE M1-4-78	SITE M1-5-63	SITE M9-0-00- 0.53	SITE M14-0-00- 2.08	SITE S22-0-44- 0.88
	<i>album*</i>												
	<i>Gnaphalium palustre</i>		X										
	<i>Gnaphalium purpureum</i>	cudweed								X		X	X
	<i>Gnaphalium stramineum</i>	coast cudweed											
	<i>Grindelia stricta</i> var. <i>platyphylla</i>	gum plant	X			X							
	<i>Grindelia stricta</i> var. <i>stricta</i>	gum plant	X										
	<i>Helenium puberulum</i>	sneezeweed								X		X	
	<i>Heterotheca sessiliflora</i> ssp. <i>bolanderi</i>	goldenaster											
	<i>Hieracium albiflorum</i>	white-flowered hawkweed		X	X					X	X	X	X
	<i>Hypochaeris glabra*</i>	smooth cat's-ear											
	<i>Hypochaeris radicata*</i>	rough cat's-ear	X	X	X	X	X	X	X	X	X	X	X
	<i>Jaumea carnosa</i>	jaumea	X										
	<i>Lactuca saligna*</i>	wild lettuce		X	X					X			
	<i>Lactuca serriola*</i>	prickly lettuce									X	X	
	<i>Lactuca virosa*</i>	wild lettuce											
	<i>Lapsana communis*</i>	nipplewort											
	<i>Leontodon taraxacoides*</i>	false dandelion		X	X								
	<i>Leucanthemum vulgare*</i>	ox-eye daisy	X			X	X	X	X	X	X	X	X
	<i>Madia exigua</i>	tarweed											
	<i>Madia gracilis</i>	slender tarweed		X	X	X							X
	<i>Madia madioides</i>	woodland madia				X		X		X	X	X	X
	<i>Madia sativa</i>	coast tarweed	X	X	X	X			X	X	X	X	X
	<i>Petasites frigidus</i> var. <i>palmatus</i>	western colt's-foot							X		X	X	
	<i>Psilocarphus tenellus</i>	woolly marbles											
	<i>Senecio bolanderi</i> var. <i>bolanderi</i>	Bolander's butterweed											
2	<i>Senecio jacobaea*</i>	tansy ragwort		X	X		X			X	X	X	X
	<i>Senecio vulgaris*</i>	groundsel		X	X								
	<i>Silybum marianum*</i>	milk thistle						X					
	<i>Soliva sessilis*</i>	soliva	X									X	
	<i>Sonchus asper</i> ssp. <i>asper*</i>	prickly sow-thistle		X	X			X	X		X	X	X
	<i>Sonchus oleraceus*</i>	common sow-thistle	X	X	X	X				X			
	<i>Tanacetum parthenium*</i>	feverfew											
	<i>Taraxacum officinale*</i>	dandelion										X	
	<i>Tragopogon porrifolius*</i>	salsify											
Berberidaceae - Barberry Family													
	<i>Achlys californica</i>	vanilla leaf											X
	<i>Berberis nervosa</i>	mahonia				X							X
	<i>Vancouveria hexandra</i>	inside-out flower											
	<i>Vancouveria planipetala</i>	redwood-ivy				X	X					X	X

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Betulaceae - Birch Family													
	<i>Alnus rubra</i>	red alder	X	X	X	X	X	X	X	X	X	X	X
	<i>Corylus cornuta</i> var. <i>californica</i>	California hazelnut		X	X	X				X		X	
Boraginaceae - Borage Family													
	<i>Cynoglossum grande</i>												
	<i>Myosotis latifolia</i> *	forget-me-not		X	X							X	X
	<i>Plagiobothrys bracteatus</i>	bracted popcorn flower										?	
	<i>Plagiobothrys reticulatus</i> var. <i>reticulatus</i>	popcorn flower										?	
Brassicaceae (aka Cruciferae) - Mustard Family													
	<i>Barbarea vulgaris</i> *	common winter cress		X	X								
	<i>Brassica nigra</i> *	black mustard	X	X	X			X	X	X			
	<i>Cakile maritima</i> *	sea rocket	X										
	<i>Cardamine californica</i> var. <i>cardiophylla</i>	milk maids				X						X	X
	<i>Cardamine oligosperma</i>	bitter cress		X	X							X	X
	<i>Raphanus sativus</i> *	wild radish	X	X	X								
	<i>Rorippa nasturtium- aquaticum</i>	water cress											
Callitrichaceae - Water Starwort Family													
	<i>Callitriches</i> p.												
Campanulaceae - Bellflower Family													
1B	<i>Campanula californica</i>	swamp harebell											
	<i>Campanula prenanthoides</i>	harebell								X	X	X	X
Caprifoliaceae - Honeysuckle Family													
	<i>Lonicera hispidula</i> var. <i>vacillans</i>	twining honeysuckle	X	X	X	X	X	X	X	X	X	X	X
	<i>Lonicera involucrata</i>	twinberry		X	X								
	<i>Sambucus racemosa</i> var. <i>racemosa</i>	red elderberry		X	X	X			X			X	
	<i>Symphoricarpos mollis</i>	creeping snowberry											
Caryophyllaceae - Pink Family													
	<i>Cerastium glomeratum</i> *	mouse-eared chickweed		X	X							X	
	<i>Cerastium fontanum</i> ssp. <i>vulgare</i> *	mouse-eared chickweed											
	<i>Lychnis coronaria</i> *												
	<i>Silene californica</i>	Indian pink											
	<i>Silene gallica</i> *	windmill pink	X	X	X								

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	<i>Spergula arvensis</i> ssp. <i>arvensis</i> *	starwort	X										
	<i>Spergularia macrotheca</i> var. <i>macrotheca</i>												
	<i>Spergularia marina</i>	sand-spurrey											
	<i>Spergularia rubra</i> *	sand-spurrey		X	X				X				
	<i>Stellaria borealis</i> ssp. <i>sitchana</i>												
	<i>Stellaria crispa</i>	chickweed											
	<i>Stellaria media</i> *	common chickweed		X	X							X	X
	<i>Stellaria pallida</i> *	chickweed		X	X								
Celastraceae													
	<i>Euonymus occidentalis</i>	burning bush				X							
Chenopodiaceae - Goosefoot Family													
	<i>Atriplex triangularis</i>	sparscale	X					X					
	<i>Chenopodium album</i> *	pigweed											
	<i>Chenopodium ambrosioides</i> *	Mexican tea; epazote											
	<i>Chenopodium pumilio</i> *	pigweed											
	<i>Salicornia virginica</i>	pickleweed	X			X							
Convolvulaceae - Morning-glory Family													
	<i>Calystegia purpurata</i> ssp. <i>purpurata</i>	morning-glory	X	X	X	X	X	X		X		X	
	<i>Convolvulus arvensis</i> *	field bindweed											
Crassulaceae - Stonecrop Family													
	<i>Crassula tillaea</i> *	pygmy stonecrop											
	<i>Dudleya</i> sp.	live-forever											
	<i>Sedum spathulifolium</i>	stonecrop											
Cucurbitaceae - Gourd Family													
	<i>Marah oreganus</i>	wild cucumber; manroot		X	X	X							
Cuscutaceae - Dodder Family													
	<i>Cuscuta salina</i> var. <i>major</i>	saltmarsh dodder; goldenthread											
Datisceae - Datisca Family													
	<i>Datisca glomerata</i>	datisca											
Ericaceae - Heath Family													
	<i>Arbutus menziesii</i>	Pacific madrone						X	X	X		X	X
	<i>Arctostaphylos columbiana</i>	hairy manzanita							X			X	X
	<i>Arctostaphylos nummularia</i>	shinyleaf manzanita											

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	<i>Arctostaphylos</i> sp. (<i>glandulosum</i> ?)	manzanita											
	<i>Chimaphila umbellata</i>	prince's pine											
	<i>Gaultheria shallon</i>	salal					X					X	X
	<i>Ledum glandulosum</i>	Labrador tea											X
	<i>Rhododendron macrophyllum</i>	California rose-bay											X
	<i>Rhododendron occidentale</i>	western azalea											
	<i>Vaccinium ovatum</i>	blue (black) huckleberry		X	X	X	X		X	X	X	X	X
	<i>Vaccinium parvifolium</i>	red huckleberry				X					X	X	X
Euphorbiaceae - Spurge Family													
	<i>Euphorbia crenulata</i>	crente spurge								X			
	<i>Euphorbia lathyris</i> *	caper spurge; gopher plant											
	<i>Euphorbia peplus</i> *	petty spurge		X	X								
Fabaceae (aka Leguminosae) - Legume Family													
	<i>Acacia dealbata</i> *	gray wattle											
	<i>Acacia melanoxydon</i> *	blackwood acacia	X										
	<i>Cytisus scoparius</i> *	Scotch broom	X	X	X						X		X
	<i>Genista monspessulana</i> *	French broom		X	X					X			
	<i>Lathyrus hirsutus</i> *	Caley pea											
	<i>Lathyrus latifolius</i> *	perennial sweet pea	X							X			
	<i>Lathyrus littoralis</i>	beach pea											
	<i>Lathyrus tingitanus</i> *	Tangier pea		X	X								
	<i>Lathyrus vestitus</i> var. <i>vestitus</i>	hillside pea		X	X	X			X	X	X	X	X
	<i>Lotus aboriginus</i>	lotus											
	<i>Lotus corniculatus</i> *	bird's-foot trefoil	X									X	
	<i>Lotus humistratus</i>	lotus											
	<i>Lotus micranthus</i>	lotus		X	X							X	
	<i>Lotus purshianus</i> var. <i>purshianus</i>	Spanish lotus				X		X	X	X	X	X	X
	<i>Lupinus arboreus</i> *	yellow bush lupine	X	X	X								
	<i>Lupinus littoralis</i>	bluff lupine											
	<i>Medicago polymorpha</i> *	California burclover	X	X	X			X	X	X			
	<i>Melilotus albus</i> *	white sweetclover											
	<i>Melilotus indicus</i> *	sourclover	X	X	X	X	X	X	X		X	X	
	<i>Trifolium campestre</i> *	shamrock clover						X					X
	<i>Trifolium dubium</i> *	hop clover										X	
	<i>Trifolium glomeratum</i> *	clover							X	X			
	<i>Trifolium incarnatum</i> *	crimson clover		X	X				X				
	<i>Trifolium microcephalum</i>	small-headed clover										X	
	<i>Trifolium oliganthum</i>	few-flowered clover										X	
	<i>Trifolium repens</i> *	white clover	X	X	X	X	X	X	X	X	X	X	X

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	<i>Trifolium subterraneum*</i>	subterranean clover											
	<i>Trifolium variegatum</i> phases 1, 5	clover	X									X	
	<i>Trifolium willdenovii</i>	tomcat clover										X	
	<i>Trifolium wormskioldii</i>	cow clover		X	X								
	<i>Ulex europaea*</i>	gorse											
	<i>Vicia gigantea</i>	giant vetch											
	<i>Vicia hirsuta*</i>	hairy-fruited vetch		X	X					X	X	X	
	<i>Vicia sativa ssp. nigra*</i>	winter vetch										X	
	<i>Vicia sativa ssp. sativa*</i>	spring vetch		X	X		X			X	X		X
	<i>Vicia tetrasperma*</i>	4-seeded vetch		X	X								
Fagaceae - Beech Family													
	<i>Chrysolepis chrysophylla</i>	giant chinquapin											
	<i>Lithocarpus densiflora</i>	tanoak	X	X	X	X			X	X	X	X	X
Frankeniaceae - Frankenia Family													
	<i>Frankenia salina</i>	alkali heath											
Garryaceae - Siltkassel Family													
	<i>Garrya fremontii</i>	coast siltkassel	X							X			
Gentianaceae - Gentian Family													
	<i>Centaurium muehlenbergii</i>	centaury		X	X		X	X	X	X		X	X
Geraniaceae - Geranium Family													
	<i>Erodium cicutarium*</i>	filaree											
	<i>Erodium moschatum*</i>	stork's-bill											
	<i>Geranium carolinianum</i>	geranium											
	<i>Geranium dissectum*</i>	geranium		X	X				X	X		X	X
	<i>Geranium molle*</i>	soft-leaved geranium		X	X							X	
	<i>Geranium retrorsum*</i>	retorse-haired geranium		X	X	X							
	<i>Geranium robertianum*</i>	geranium Robert		X	X								
Grossulariaceae - Currant Family													
	<i>Ribes bracteosum</i>	stink currant											
	<i>Ribes menziesii</i>	Menzies's gooseberry		X	X								
	<i>Ribes sanguineum</i> var. <i>glutinosum</i>	pink-flowering currant		X	X								
Haloragaceae - Water-milfoil Family													
	<i>Myriophyllum aquaticum*</i>	parrot's feather											
Hippuridaceae - Mare's-Tail Family													
	<i>Hippuris vulgaris</i>	mare's-tail											

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Hydrophyllaceae - Waterleaf Family				X	X								
	<i>Hydrophyllum tenuipes</i>	waterleaf							X			X	
	<i>Nemophila heterophylla</i>	hillside nemophila		?	?							X	
	<i>Nemophila parviflora</i> var. <i>austinae</i>	small-flowered nemophila		?	?								
	<i>Phacelia bolanderi</i>	Bolander's phacelia										X	
	<i>Romanzoffia californica</i>	romanzoffia										X	
Hypericaceae - St. John's Wort Family													
	<i>Hypericum perforatum</i> *	Klamath weed											X
	<i>Hypericum canariense</i> *												
Juglandaceae - Walnut Family													
	<i>Juglans californica</i> *	California black walnut											
Lamiaceae - Mint Family													
	<i>Glechoma hederacea</i> *	ground-ivy											
	<i>Melissa officinalis</i> *	bee balm; lemon balm								X			
	<i>Mentha arvensis</i>	mint											
	<i>Mentha pulegium</i> *	pennyroyal							X	X		X	X
	<i>Mentha spicata</i> var. <i>spicata</i> *	spearmint											
	<i>Monardella villosa</i>	coyote mint											
	<i>Prunella vulgaris</i> var. <i>lanceolata</i>	self-heal				X	X	X	X	X		X	X
	<i>Satureja douglasii</i>	yerba buena								X		X	
	<i>Stachys ajugoides</i> var. <i>rigida</i>	hedge-nettle	X	X	X	X		X	X		X	X	X
	<i>Stachys chamissonis</i>	bog hedge-nettle		X	X							X	
Lauraceae - Laurel Family													
	<i>Umbellularia californica</i>	California bay	X	X	X	X	X		X	X	X	X	X
Linaceae - Flax Family													
	<i>Linum bienne</i> *	flax	X					X	X	X		X	X
	<i>Linum usitatissimum</i> *	common flax											
Lythraceae - Loosestrife Family													
	<i>Lythrum hyssopifolium</i> *	common loosestrife						X	X				
Malvaceae - Mallow Family													
	<i>Malva neglecta</i> *	bull mallow											
	<i>Modiola caroliniana</i> *	modiola											
Myoporaceae - Myoporum Family													

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	<i>Myoporum laetum</i> *	myoporum											
Myricaceae - Wax Myrtle Family													
	<i>Myrica californica</i>	Pacific wax myrtle	X			X				X	X	X	X
Myrtaceae - Myrtle Family													
	<i>Eucalyptus globulus</i> *	Tasmanian bluegum											
Nyctaginaceae - Four-O'Clock Family													
	<i>Abronia latifolia</i>	yellow sand-verbena	X										
1B	<i>Abronia umbellata</i> ssp. <i>breviflora</i>	pink sand-verbena	X										
Nymphaeaceae - Waterlily Family													
	<i>Nuphar lutea</i> ssp. <i>polysepala</i>	cow-lily											
Oleaceae - Olive Family													
	<i>Fraxinus latifolia</i>	Oregon ash								X			
Onagraceae - Evening Primrose Family													
	<i>Camissonia cheiranthifolia</i>	beach evening primrose	X										
	<i>Clarkia amoena</i>	farewell-to-spring											
	<i>Clarkia concinna</i>	red ribbons										X	
	<i>Epilobium brachycarpum</i>	willow-herb								X		X	X
	<i>Epilobium ciliatum</i> ssp. <i>glandulosum</i>	willow-herb		X	X	X	X		X	X	X	X	
	<i>Epilobium minutum</i>	willow-herb											
	<i>Fuchsia</i> sp.*	ornamental fuchsia											
	<i>Oenothera elata</i> ssp. <i>hookeri</i>	Hooker's evening primrose	X										
Oxalidaceae - Oxalis Family													
	<i>Oxalis albicans</i>	sorrel											
	<i>Oxalis corniculata</i> *	sorrel											
	<i>Oxalis oregana</i>	redwood sorrel		X	X		X	X	X		X	X	X
	<i>Oxalis pes-caprae</i> *	Bermuda-buttercup											
Papaveraceae - Poppy Family													
	<i>Dicentra formosa</i>	bleeding heart						X				X	X
	<i>Eschscholzia californica</i>	California poppy		X	X								
Philadelphaceae - Mock Orange Family													
	<i>Philadelphus lewisii</i> *	wild mock orange											
	<i>Whipplea modesta</i>	modesty; yerba de selva				X				X	X	X	X
Plantaginaceae - Plantain Family													

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	<i>Plantago coronopus*</i>	plantain	X	X	X								
	<i>Plantago lanceolata*</i>	English plantain	X	X	X	X	X	X	X	X	X	X	X
	<i>Plantago maritima</i>	coast plantain				X							
	<i>Plantago major*</i>	common plantain										X	X
	<i>Plantago subnuda</i>	plantain				X	X		X	X		X	
Polemoniaceae - Phlox Family													
	<i>Collomia heterophylla</i>	collomia					X						X
	<i>Gilia capitata</i>	gilia											
	<i>Linanthus acicularis</i>	linanthus											
	<i>Navarretia squarrosa</i>	skunkweed							X	X	X	X	X
Polygalaceae - Milkwort Family													
	<i>Polygala californica</i>	California milkwort								X		X	X
Polygonaceae - Knotweed Family													
	<i>Eriogonum latifolium</i>	coast buckwheat											
	<i>Eriogonum nudum</i>	naked-stemmed buckwheat											
	<i>Polygonum arenastrum*</i>	common knotweed	X							X			
	<i>Polygonum paronychia</i>	dune knotweed	X										
	<i>Polygonum punctatum</i>	knotweed											
	<i>Pterostegia drymarioides</i>	pterostegia											
	<i>Rumex acetosella*</i>	sheep sorrel	X	X	X					X			
	<i>Rumex conglomeratus*</i>		X	X	X	X	X		X	X	X	X	X
	<i>Rumex crispus*</i>	curly dock	X	X	X								
	<i>Rumex obtusifolius*</i>	dock		X	X	X							
	<i>Rumex salicifolius</i> var. <i>crassus</i>	willow dock					X		X				
	<i>Rumex salicifolius</i> var. <i>transitorius</i>	willow dock											
Portulacaceae - Purslane Family													
	<i>Calandrinia ciliata</i>	red maids		X	X								
	<i>Claytonia perfoliata</i>	miner's lettuce		X	X				X	X		X	
	<i>Claytonia sibirica</i>	candy flower		X	X								
	<i>Montia fontana</i>	water-chickweed											
	<i>Montia parvifolia</i>	little miner's lettuce										X	
Primulaceae - Primrose Family													
	<i>Anagallis arvensis*</i>	scarlet pimpernel		X	X			X		X		X	
	<i>Trientalis latifolia</i>	starflower						X		X		X	X
Ranunculaceae - Buttercup Family													
	<i>Actaea rubra</i>	baneberry											X
	<i>Anemone</i> sp.*	anemone (cultivated)											
	<i>Aquilegia formosa</i>	red columbine									X	X	
	<i>Coptis laciniata</i>	goldthread										X	

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	<i>Delphinium nudicaule</i>	scarlet larkspur											
	<i>Ranunculus californicus</i>	California buttercup										X	
	<i>Ranunculus hebecarpus</i>	buttercup											
	<i>Ranunculus muricatus*</i>	stickseed buttercup											
	<i>Ranunculus parviflorus</i>											X	
	<i>Ranunculus repens*</i>	creeping buttercup											
	<i>Ranunculus uncinatus</i>	buttercup									X	X	X
Rhamnaceae - Buckthorn Family													
	<i>Ceanothus thyrsiflorus</i>	blueblossom		X	X	X	X	X	X	X	X	X	X
	<i>Rhamnus californica</i>	coffeeberry								X		X	
	<i>Rhamnus purshiana</i>	cascara sagrada		X	X	X	X		X	X		X	X
Rosaceae - Rose Family (20 taxa)													
	<i>Aphanes occidentalis</i>	lady's-mantle											
	<i>Cotoneaster lactea*</i>	cotoneaster	X									X	
	<i>Cotoneaster pannosa*</i>	cotoneaster											
	<i>Fragaria chiloensis</i>	beach strawberry					X						
	<i>Fragaria vesca</i>	wood strawberry				X				X	X	X	X
	<i>Holodiscus discolor</i>	ocean spray		X	X					X		X	
	<i>Horkelia californica</i>	horkelia											
	<i>Malus sylvestris*</i>	cultivated apple											
	<i>Oemleria cerasiformis</i>	oso berry		X	X								
	<i>Potentilla anserina</i> ssp. <i>pacifica</i>	cinquefoil										X	
	<i>Potentilla glandulosa</i> ssp. <i>glandulosa</i>	sticky cinquefoil											
	<i>Potentilla palustris</i>	marsh cinquefoil											
	<i>Prunus</i> sp.*	cultivated plums, cherries											
	<i>Pyracantha angustifolia*</i>	firethorn											
	<i>Rosa eglanteria*</i>	sweet-brier											
	<i>Rosa gymnocarpa</i>	wood rose				X	X		X			X	X
	<i>Rubus armeniacus*</i>	Himalayan blackberry	X	X	X		X			X		X	X
	<i>Rubus leucodermis</i>	blackcap raspberry		X	X				X	X	X	X	X
	<i>Rubus parviflorus</i>	thimbleberry	X	X	X	X	X	X	X	X	X	X	X
	<i>Rubus spectabilis</i>	salmonberry		X	X							X	
	<i>Rubus ursinus</i>	California blackberry		X	X	X	X	X	X	X	X	X	X
Rubicaceae - Madder Family													
	<i>Galium aparine</i>	goosegrass; bedstraw		X	X		X		X		X	X	X
	<i>Galium californicum</i>	California bedstraw		X	X				X				
	<i>Galium divaricatum*</i>	bedstraw											
	<i>Galium porrigens</i>	bedstraw	X				X						
	<i>Galium parisiense*</i>	wall bedstraw		X	X							X	
	<i>Galium trifidum</i>	bedstraw											

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	<i>Galium triflorum</i>	sweet-scented bedstraw		X	X		X			X		X	
Salicaceae - Willow Family													
	<i>Salix hookeriana</i>	coastal willow											
	<i>Salix lasiolepis</i>	arroyo willow											
	<i>Salix lucida</i> ssp. <i>lasiandra</i>	shining willow							X				
	<i>Salix scouleriana</i>	Scouler's willow							X	X	X		
	<i>Salix sitchensis</i>	Sitka willow		X	X					X		X	
Saxifragaceae - Saxifrage Family													
	<i>Boykinia occidentalis</i>	boykinia											
	<i>Heuchera micrantha</i>	alumroot								X		X	
	<i>Heuchera pilosissima</i>	alumroot											
1B	<i>Mitella caulescens</i>	leafy mitella		X	X								
	<i>Mitella ovalis</i>	bishop's cap				X	X				X		X
	<i>Saxifraga mertensiana</i>	Merten saxifrage										X	
	<i>Tellima grandiflora</i>	fringe cups		X	X	X						X	X
	<i>Tiarella trifoliata</i> var. <i>unifoliata</i>	sugar-scoop				X					X	X	
	<i>Tolmiea menziesii</i>	pig-a-back plant		X	X								
Scrophulariaceae - Figwort Family													
	<i>Bacopa repens</i>	creeping waterhyssop								X			
1B	<i>Castilleja ambigua</i> var. <i>humboldtensis</i>	Humboldt Bay owl's- clover											
	<i>Castilleja wightii</i>	Wight's paintbrush											
	<i>Digitalis purpurea</i> *	foxglove		X	X		X		X			X	X
	<i>Mimulus aurantiacus</i>	sticky monkeyflower		X	X	X	X			X			
	<i>Mimulus guttatus</i>	common monkeyflower	X										
	<i>Mimulus moschatus</i>	musk monkeyflower					X						
	<i>Parentucellia viscosa</i> *	parentucellia											
	<i>Scrophularia californica</i>	bee plant; figwort		X	X		X		X	X		X	
	<i>Synthyris reniformis</i>	snow queen											X
	<i>Triphysaria pusilla</i>												
	<i>Veronica americana</i>	American brooklime					X		X			X	
Solanaceae - Nightshade Family													
	<i>Solanum americanum</i>	nightshade		X	X	X	X			X			
	<i>Solanum douglasii</i>	nightshade											
	<i>Solanum furcatum</i> *	nightshade											
	<i>Solanum xantii</i>	nightshade											
Tamaricaceae - Tamarisk Family													
	<i>Tamarix parviflora</i> *	tamarisk											
Trapaeolaceae - Nasturtium Family													
	<i>Trapaeolum majus</i> *	garden nasturtium											

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Urticaceae - Nettle Family													
	<i>Urtica dioica</i>	stinging nettle		X	X		X		X	X	X	X	
Valerianaceae - Valerian Family													
	<i>Plectritis brachystemon</i>	small longspur										X	
Violaceae - Violet Family													
	<i>Viola glabella</i>	stream violet							X			X	
	<i>Viola sempervirens</i>	redwood violet				X	X		X	X	X	X	X
Class MONOCOTYLEDONES													
Alismataceae - Water-Plantain Family													
	<i>Alisma plantago-aquatica</i>	water-plantain							X				
Araceae - Arum Family													
	<i>Arum</i> sp.*	jack-in-the-pulpit											
	<i>Lysichiton americanum</i>	yellow skunk cabbage		X	X								
	<i>Zantedeschia aethiopica</i> *	calla lily											
Cyperaceae - Sedge Family													
2	<i>Carex californica</i>	sedge											
	<i>Carex cusickii</i>	sedge											
	<i>Carex deweyana</i> ssp. <i>leptopoda</i>	sedge		X	X	X			X	X	X	X	X
	<i>Carex globosa</i>	sedge										X	X
	<i>Carex gynodynama</i>					X							
	<i>Carex harfordii</i>	sedge				X			X			X	
	<i>Carex hendersonii</i>	Henderson's sedge		X	X								
2	<i>Carex lyngbyei</i>	sedge											
	<i>Carex mendocinensis</i>	Mendocino sedge					X				X		
	<i>Carex nudata</i>	sedge											
	<i>Carex obnupta</i>	slough sedge	X			X	X		X	X		X	X
	<i>Carex subbracteata</i>						X						
	<i>Carex</i> sp. (Group 2)									X			
	<i>Cyperus eragrostis</i>	nut-sedge		X	X	X	X	X	X	X		X	X
	<i>Eleocharis macrostachya</i>	spike-rush				X							
	<i>Eleocharis pachycarpa</i> *	spike-rush											
	<i>Scirpus acutus</i>	tule											
	<i>Scirpus americanus</i>	bulrush											
	<i>Scirpus cernuus</i>	common threesquare											
	<i>Scirpus maritimus</i>	salt marsh bulrush											
	<i>Scirpus microcarpus</i>	small-fruited bulrush		X	X	X	X		X		X		
	<i>Scirpus robustus</i>	bulrush											
Iridaceae - Iris Family													

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	<i>Crocoshia Xrocoshmiflora*</i>	montbretia		X	X								
	<i>Iris douglasiana</i>	Douglas's iris		X	X	X	X			X	X	X	X
	<i>Sisyrinchium bellum</i>	blue-eyed grass		X	X			X					
Juncaceae - Rush Family													
	<i>Juncus articulatus</i>	joint-leaved rush				X		X					
	<i>Juncus balticus</i>	Baltic rush											
	<i>Juncus bolanderi</i>	Bolander's rush						X	X				
	<i>Juncus breweri</i>	Brewer's rush											
	<i>Juncus bufonius</i>	toad rush		X	X	X	X	X				X	
	<i>Juncus effusus</i>	green rush		X	X	X	X	X	X	X	X	X	X
	<i>Juncus patens</i>	gray rush		X	X	X	X	X	X	X		X	X
	<i>Juncus xiphioides</i>	iris-leaved rush										X	
	<i>Luzula comosa</i>	hairy wood-rush										X	
	<i>Luzula parviflora</i>	wood rush									X	X	
Juncaginaceae - Arrow-grass Family													
	<i>Triglochin maritima</i>	seaside arrow-grass	X			X							
Lemnaceae - Duckweed Family													
	<i>Lemna minor</i>	duckweed											
Liliaceae - Lily Family													
	<i>Chlorogalum pomeridianum</i>	soap plant											
	<i>Clintonia andrewsiana</i>	clintonia											
	<i>Dichelostemma capitatum</i>	blue dicks											
	<i>Disporum hookeri</i>	Hooker's fairy bells		X	X		X				X	X	
	<i>Disporum smithii</i>	Smith's fairy bells				X						X	
	<i>Hyacinthus orientalis*</i>	hyacinth											
	<i>Kniphofia uvaria*</i>	red-hot poker											
	<i>Lilium pardalinum</i>	leopard lily											X
	<i>Muscari armeniacum*</i>	grape-hyacinth											
	<i>Narcissus sp.*</i>	daffodil											
	<i>Scoliopus bigelovii</i>	fetid adder's-tongue				X						X	
	<i>Smilacina racemosa</i>	false Solomon's-seal		X	X	X	X			X			
	<i>Smilacina stellata</i>	little Solomon's-seal											
	<i>Trillium ovatum</i> var. <i>ovatum</i>	wake robin				X	X						
	<i>Triteleia laxa</i>	Ithuriel's spear											
	<i>Veratrum fimbriatum</i>	corn lily											
	<i>Xerophyllum tenax</i>	beargrass											
Orchidaceae - Orchid Family													
	<i>Calypso bulbosa</i>	calypso orchid											
	<i>Epipactis gigantea</i>	stream orchid											
	<i>Listera convallarioides</i>	broad-leaved twayblade											

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	<i>Goodyera oblongifolia</i>	rattlesnake plantain											
	<i>Spiranthes porrifolia</i>	western ladies' tresses											
Poaceae (aka Graminae) - Grass Family													
	<i>Aira caryophylla</i> *	silver European hairgrass										X	X
	<i>Agrostis densiflora</i>	California bentgrass											
	<i>Agrostis exarata</i>	bentgrass											
	<i>Agrostis hallii</i>	Hall's bentgrass				X							
	<i>Agrostis stolonifera</i> *	redtop bentgrass	X				X		X				X
	<i>Ammophila arenaria</i> *	European beachgrass											
	<i>Anthoxanthum odoratum</i> *	sweet vernal grass	X	X	X		X					X	
	<i>Avena barbata</i> *	slender wild oat	X	X	X	X	X	X	X	X			
	<i>Briza maxima</i> *	rattlesnake grass	X	X	X		X		X				
	<i>Briza minor</i> *	little quaking grass					X					X	
	<i>Bromus carinatus</i> var. <i>carinatus</i>	California brome		X	X	X	X			X		X	X
	<i>Bromus diandrus</i> *	ripgut brome		X	X		X						
	<i>Bromus hordeaceus</i> *	soft chess				X							
	<i>Bromus laevipes</i>	woodland brome		X	X	X	X		X	X	X	X	X
	<i>Bromus pacificus</i> ²	Pacific brome											
4	<i>Calamagrostis bolanderi</i>	Bolander's reedgrass											
	<i>Calamagrostis koelerioides</i>	fire reedgrass											
	<i>Cortaderia jubata</i> *	jubatagrass		X	X	X	X	X	X	X	X	X	X
	<i>Cynodon dactylon</i> *	Bermuda grass											
	<i>Cynosurus echinatus</i> *	dogtail grass				X			X	X	X	X	X
	<i>Dactylis glomerata</i> *	orchard grass		X	X		X		X	X		X	
	<i>Danthonia californica</i>	California oatgrass	X										
	<i>Deschampsia cespitosa</i>	California hairgrass											
	<i>Deschampsia elongata</i>	slender hairgrass				X			X			X	X
	<i>Distichlis spicata</i>	saltgrass	X										
	<i>Echinochloa crus-galli</i> *	barnyard grass											
	<i>Elymus glaucus</i>	blue wildrye	X	X	X		X		X	X	X	X	X
	<i>Festuca arundinacea</i> *	tall fescue		X	X					X			
	<i>Festuca idahoensis</i>	Idaho fescue											
	<i>Festuca subulata</i>	bearded fescue											
	<i>Glyceria borealis</i>	mannagrass											
	<i>Glyceria elata</i>	mannagrass											
	<i>Hierochloë occidentalis</i>	sweetgrass					X				X	X	X
	<i>Holcus lanatus</i> *	purple velvet grass	X	X	X	X	X	X	X	X	X	X	X
	<i>Hordeum brachyantherum</i>	meadow barley		X	X								
	<i>Hordeum murinum</i> ssp. <i>leporinum</i> *	barley											
	<i>Hordeum vulgare</i> *	cereal barley											
	<i>Lagurus ovatus</i> *	hare's tail											
	<i>Leymus mollis</i>	dune garss	X										

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	<i>Lolium multiflorum</i> *	Italian ryegrass	X	X	X	X		X	X	X	X	X	X
	<i>Lolium perenne</i> *	perennial ryegrass											
	<i>Melica californica</i>	California oniongrass									X	X	
	<i>Melica geyeri</i>	melic									X		
	<i>Melica harfordii</i>	Harford's melic							X				
	<i>Melica subulata</i>	Alaska oniongrass										X	
	<i>Melica torreyana</i>	melic		X	X					X			
	<i>Muhlenbergia mexicana</i>	muhly											
	<i>Paspalum dilatatum</i> *	Dallis grass											
	<i>Pennisetum clandestinum</i> *	kikiyu grass											
	<i>Phalaris aquatica</i> *	Harding grass											
	<i>Phalaris arundinacea</i>	reed canary grass											
	<i>Poa annua</i> *	annual bluegrass		X	X							X	
	<i>Poa douglasii</i>	dune bluegrass	X										
	<i>Poa kelloggii</i>	Kellogg's bluegrass											
	<i>Polypogon monspeliensis</i> *	annual beardgrass				X		X					X
	<i>Polypogon interruptus</i> *	ditch beardgrass					X						
	<i>Trisetum canescens</i>	trisetum											
	<i>Triticum aestivum</i> *	wheat											
	<i>Vulpia myuros</i> *	rattail fescue		X	X	X				X		X	
Potamogetonaceae - Pondweed Family													
	<i>Potamogeton nodosus</i>	long-leaved pondweed											
Typhaceae - Cattail Family													
	<i>Sparganium emersum</i> ssp. <i>emersum</i>	bur-reed											
	<i>Typha latifolia</i>	cattail											
Zosteraceae - Eel-grass Family													
	<i>Zostera marina</i>	eelgrass	X										
	updated 8/18/05 Warner + Sholars + Maslach												
	* = non-native												
	² identified from Hitchcock (not listed in Hickman et al.)												